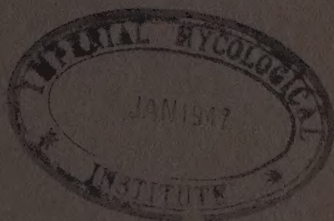


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Erratum.

Vol. 16. p. 347, 3rd para. For "[see V.B. 7. 412 . . .",
 read "[see V.B. 7. 419 . . ."

REVIEW ARTICLES

- (1) "The Present Position of Pheno-hiazine as an Anthelmintic".
- (2) "Trichomoniasis—A Review of Recent Literature".

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[No. 11.]

DISEASES CAUSED BY BACTERIA AND FUNGI

AMON, G., MERCIER, P., & RICHOU, R. (1942.) L'anatoxithérapie spécifique des affections dues au staphylocoque. Résultats précisions sur la conduite du traitement. [Treatment of staphylococcal infections with anatoxin.]—*Rev. Immunol.* 7. 179-187. 2205

An account is given of the treatment with staphylococcal toxoid of 2,000 cases of skin infection in man. Good results are obtained if the antitoxin reaches a sufficiently high level in the blood of the patient.—B. W.

ORSSMAN, J. (1941.) Staphylokokken XVI. Was bedeutet die negativ chemotaktische Substanz für die Staphylokokkeninfektion? [Studies in staphylococci. XVI. Significance of the negatively chemotactic substance in staphylococcal infection.]—*Acta path. microbiol. scand.* 18. 517-532. [In German.] [For previous parts, see *V. B.* 11. 345.] 2206

F. maintains that the leucocytes cannot be regarded as the main preventive mechanism against staphylococcal infections: the most important inhibiting elements are the cells of the reticulo-endothelial system. In this paper he shows that staphylococci do not contain a negative chemotactic substance. The existence of such substance is contra-indicated by the phagocytosis that occurs *in vitro* as well as *in vivo* in the pleural or peritoneal cavities; this is confirmed by the lack of influence on phagocytosis by immune sera. The inability of anti-negative-chemotactic sera to prevent infection when staphylococci are introduced by the intravenous route further disproves the presence of such a substance in the organisms.

F. considers that the intrapleural route of infection with staphylococci in rabbit experiments is particularly reliable; the intravenous route is, however, satisfactory.—E. KLIENEBERGER-NOBEL.

LIOTT, S. D. (1945.) A proteolytic enzyme produced by group A streptococci with special reference to its effect on the type-specific M antigen.—*J. exp. Med.* 81. 573-592. 2207

E. showed that under favourable conditions, group A streptococci may produce in broth cultures an extra-cellular proteolytic enzyme, the power of which is greatly increased by the presence of living bacterial cells. Under favourable conditions the enzyme is capable of attacking the type-specific M antigens of many of the Group A streptococci; it appears to reach the peak of its activity at 37°C. It was found, however, that enzyme-producing strains of organisms could be induced to yield M substance in bacterial extracts allowing growth at 22°C., whilst cultures which inhibited the presence of M substance after growth at 37°C. did not produce the enzyme.

Substances attacked by the enzyme included

human and rabbit fibrin, streptococcal fibrolysin, casein, milk and gelatin.—J. C. BUXTON.

ROTHBARD, S. (1945.) Bacteriostatic effect of human sera on group A streptococci. I. Type-specific antibodies in sera of patients convalescing from group A streptococcal pharyngitis. II. Comparative bacteriostatic effect of normal whole blood from different animal species in the presence of human convalescent sera. III. Interference with bacteriostatic activity by blockage of the leucocytes.—*J. exp. Med.* 82. 93-106, 107-118 & 119-132. 2208

Sera from three adults convalescent from Group A streptococcal infections of the respiratory tract contained type specific antibodies, demonstrable by a bacteriostatic test. The test consisted of the determination of the specific property of serum for sensitizing Group A streptococci to the action of the leucocytes contained in human whole blood.

Small quantities of culture, which had been preserved by freezing and serum in various dilutions were added to tubes containing heparinized whole blood and incubated at 37°C. for three hours, whilst being slowly rotated. The mixture was then streaked out to rabbit blood agar plates and the presence or absence of growth was noted after 18-24 hours' incubation. The type-specific antibodies present in the sera of the three patients appeared in 3-5 weeks and in two cases persisted for about 37 weeks after the onset of infection. Cross reactions were not observed between heterologous types and each serum showed approximately equal bacteriostasis for seven strains of the same type as that which caused the infection.

In spite of the many technical difficulties associated with this method, it is recommended as being useful for the study of type-specific immunity to streptococcal infection.

One of the disadvantages of the test, however, was the fact that certain samples of human blood caused bacteriostasis without the addition of convalescent serum. Experiments were therefore carried out to assess the value of the whole blood of species other than human and to decide which was the best of the anticoagulants for use in the bacteriostatic test. Blood was obtained from children, rabbits, g. pigs and sheep and the effects upon the leucocyte count of human blood of defibrination, potassium and ammonium oxalate, sodium citrate and heparin showed the last named to be the best anticoagulant for this purpose. The blood of the three animal species chosen could not be substituted for human blood when convalescent human sera supplied the antibody, nor could animal leucocytes or plasma from these species replace the corresponding portion of human blood. Complement, leucocytes and

a thermostable factor which was active at a dilution of 1-12 after storage at 4°C. for seven weeks, which were present in human plasma, were all essential factors in the test.

By mixing the sera of adults convalescing from streptococcal infections of three antigenic types with dilutions of extracts of the same types, it was found that both the type specific M and group-specific C substances of Group A streptococci inhibited bacteriostasis of these organisms in the test, although the extracts did not antagonize each other and inhibition of bacteriostasis was not confined specifically to types.

Antigen-antibody precipitates also interfered with bacteriostasis, whereas the supernatant fluid resulting from such interactions did not. Polymorphonuclear leucocytes and monocytes in stained blood films were seen to be engorged with precipitated matter following treatment with antigen-antibody mixtures and these cells subsequently failed to phagocytose streptococci. Living leucocytes showed an unselective phagocytosis of streptococci and precipitated matter and since their capacity of ingestion was limited, blockage of phagocytosis took place.—J. C. Buxton.

CRAWSHAW, E. J. (1944.) The common cold. (A revolutionary hypothesis.)—*Med. Pr. Circ.* June 28. 407-413. 2209

The hypothesis is advanced that catarrhal rhinitis in man and catarrhal mastitis in cows are analogous conditions, both being the result of damage to the mucous membranes during the excretion of toxic products which have been produced in the body as a result of exposure to cold.

The susceptibility of both man and cow to the injurious effects of cold is stated to be a result of artificial methods of housing and clothing and can be obviated, in cows, by exposure from birth onwards for several generations to severe climatic conditions. It is claimed that a hardy strain of Jersey cattle has been produced by application of the method over a period of 20 years.

It is stated that an adult cow housed and managed under the conditions generally adopted by dairymen can, with care, be acclimatized to winter out but such a cow will always shiver in cold weather. If her calf is born and reared out of doors in autumn or winter it will not shiver, but will grow a very thick winter coat. If the process be continued for 3-4 generations the winter coat will be much less thick and will not "stare" even during a snowstorm.

The strain of Jersey cows produced by breeding under such conditions is said to be immune to catarrhal mastitis.

The widely held belief that cows' milk with fat globules of large size, especially from breeds such as the Jersey, is indigestible by human babies is declared to be a fiction. C. believes that the indigestibility of cows' milk is due not to the size of the fat globules but to toxic products in it, these toxic products being present because the great majority of cows under normal methods of management are affected with catarrhal mastitis. In support of this belief he cites his own herd of Jersey cows, where milk, suitably diluted, is stated to be as well digested by babies as is human milk. The results of rearing babies on this raw milk are said to be so good that they must be seen to be believed.

C. makes it clear that when he uses the term catarrhal mastitis he refers to a non-infective condition. It is stated to be incurable and is frequently followed by infection, the only sign of the non-infective condition being the presence of mucus in the milk.

It is said that the outdoor methods of rearing advocated not only prevent catarrhal mastitis but prolong

the useful life of the cow, obviate calving troubles and prevent TB.

A great part of the paper is concerned with a discussion of the physics of heat and cold, with the object of proving that cold is a form of kinetic energy, although opposed to heat and as such, capable of producing traumatic injury.—M. C.

SEELYE, H. W., JR., ANDERSON, E. O., & PLASTRIDGE, W. N. (1944.) Mastitis and the plate count of milk. V. The behavior of *Streptococcus uberis* in milk held at different temperatures.—*J. Milk Technol.* 7. 337. [For part IV, see V. B. 16. 289.] 22

When *Str. uberis* was added to sterile skimmed milk growth occurred at 40°F. but was slow. The pH of cultures held at 40°F. and 50°F. did not alter, but at higher temperatures the reaction became markedly more acid.

If milk is properly cooled, the presence of *S. uberis* mastitis in the herd should not, therefore, contribute materially to the plate count and the acid tests, which are important criteria in determining the acceptability of milk at the milk plant.—I. W. J.

BAZELEY, P. L. (1942.) Studies with equine streptococci. 4. Cross-immunity to *Streptococcus equi*.—*Aust. vet. J.* 18. 189-194. [For part 3, see V. B. 16. 179.] 22

This work provides some experimental evidence to support the already strong chemical evidence that only one immunological type of *Str. equi* exists, at least in Australia. 32 strains of the organism were collected from 26 distinct outbreaks of disease and tested for virulence in unprotected mice and in mice protected by serum prepared from a single strain. In all cases definite cross protection was shown by the univalent serum.—N. WICKHAM.

BAZELEY, P. L. (1943.) Studies with equine streptococci. 5. Some relations between virulence of *Streptococcus equi* and immune response in the horse.—*Aust. vet. J.* 19. 62-85. [For part 4, see above preceding.] [Author's summary copied verbatim.] 22

1. The virulence of 44-hour growth cultures of *Str. equi* in causing strangles in young foals, and the apparent avirulence of the older 24-hour variety was demonstrated. The results suggest that the young rapidly-dividing organism is the only infective one.

2. Twenty-four-hour culture streptococci were shown to have little or no resistance to phagocytosis by equine polymorphs, and are engulfed in large numbers. Streptococci from cultures four and a half hours old on the other hand are not ingested readily, although this varies according to the concentration of immune antibodies in their environment and the degree of virulence attained.

3. Experiments show that young-culture organisms possess a high surface electric charge which is almost negligible on older organisms. The sign and degree of this charge on young organisms is investigated in relation to the rôle of equine polymorphs.

4. Comparison is made between the rise in immunity in horses recovered from strangles and those vaccinated by a young-culture vaccine. Serum protection of mice and phagocytosis preparations were employed for this purpose. Evidently a course of vaccination with organisms killed in the virulent phase has produced identical response to that conferred by natural attack so far as the host's serum is concerned.

STEIN, C. D. (1945.) The history and distribution of anthrax in livestock in the United States.—*Vet. Med.* 40. 340-349. 22

Little is known of the early history of anthrax in the U.S.A. The earliest reference (CARPENTER, 18

is to the outbreaks at the mouth of the Mississippi River and by 1835 it existed in all parts of the State of Louisiana. A disease believed to be anthrax was prevalent (PENNOCK, 1836) near Philadelphia in 1834 among cattle grazed on a common and among persons who skinned infected animals. Later references are also quoted.

A survey including the 12 years 1933-44 inclusive shows that 405 counties in 37 states reported outbreaks. During the past ten years widespread or severe outbreaks have occurred in South Dakota, Nebraska, Mississippi, Louisiana, Texas and California. Serious outbreaks have occurred in recent years in Arkansas, Alabama, New Mexico and Nevada. The states reporting the largest number of small sporadic outbreaks in recent years are Colorado, Iowa, Maryland, Minnesota, New York, North Carolina, North Dakota and Virginia. In certain well recognized areas of infection annual vaccination is carried out at state expense.

A map shows the areas in the U.S.A. in which outbreaks occurred during 1915-33. Although in the U.S.A. anthrax mainly affects cattle, outbreaks are encountered, in order of frequency, in horses, mules, sheep and swine. Occasional cases have occurred in farm dogs and cats which have eaten infected meat and cases among goats and deer have been reported from Texas. Animals in captivity became infected from eating infected meat. Reports of deaths from anthrax include 163 of a total of 516 mink, three mountain lions, three honey bears and one badger, leopard, tiger, fox, jaguar, civet cat, bob cat, owl and Longhorn steer. The states reporting the most cases among human beings during 1915-44 are the industrial areas of Pennsylvania, New York, Massachusetts and New Jersey and the agricultural areas of Texas, California, Louisiana and Mississippi.

In the U.S.A. anthrax usually occurs in epizootic form in regions where the disease has existed for long periods. In these districts the disease occurs in late summer and early autumn when flies are very numerous. It can be kept in check by annual pre-seasonal vaccination of all livestock with intradermal anthrax spore vaccine, which has given excellent results.—J. A. G.

CORPER, H. J. (1946.) Fundamental information on the mechanism of specific tuberculo-immunity.—*J. Lab. clin. Med.* 31, 346-353. 2214

In this review C. summarizes the results of ten years' work on tuberculo-allergy and tuberculo-immunity. It is claimed that these two phenomena can arise in the same animal, but that they have no apparent connexion. For this reason it is believed that tuberculin therapy is of no value, since desensitization against tuberculin-allergic intoxication exerts no appreciable effect on a progressive TB.

A state of allergy results from the injection of reasonably small numbers of living virulent bacilli and from large doses of heat-killed bacilli; immunity, on the other hand, develops when living avirulent organisms are introduced in sufficiently large numbers.

The article does not lend itself to detailed abstraction and should be consulted in the original.—R. E. G.

POOL, W. A. (1945.) The eradication of tuberculosis in cattle. Disease in relation to animal husbandry.—*Proc. R. Soc. Med.* 39, 77-82. 2215

Attention is drawn to the loss to the community sustained by the effects of TB. in cattle in Great Britain and to the measures which might be taken to reduce these losses. Much could be accomplished by changing the standards upon which at present farmers rely in purchasing animals. Too much attention is paid to conformity and too little to the state of health. The

increase in the numbers of "flying" herds, failure to improve farm buildings when planning new premises and the lack of suitable supplies of pure water are also stressed.

From the veterinary point of view, BCG vaccine might in certain circumstances help control the disease. The main line of attack, however, should be the elimination of the disease by the regular application of tuberculin tests and the removal of reactors. Such schemes should be made sufficiently attractive by the provision of adequate financial assistance to the farmers and should be re-enforced by disinfection of the premises, adequate meat inspection, whereby tuberculous infections can be traced to their source, and instruction to farmers and their employees.

At the present time the widespread application of such a scheme would be difficult, owing to the shortage of healthy cattle to replace reactors and the insufficiency of veterinary surgeons to undertake the work.

—R. E. GLOVER.

GUNN, F. D., MILLS, M. A., SHEPARD, C. C., & BARTH, E. E. (1943.) Experimental pulmonary tuberculosis in the dog. Reinfection.—*Amer. Rev. Tuberc.* 47, 78-96. [Spanish summary.] 2216

The authors showed that after intrabronchial and intratesticular injections of virulent tubercle bacilli, a hypersensitivity to tuberculo-protein generally develops within a few weeks, as shown by tests with Old Tuberculin or P.P.D. The maximum cutaneous allergy is usually reached within 60 days.

Results obtained from infecting and reinfecting dogs experimentally with virulent tubercle bacilli, led the authors to conclude that resistance to tuberculous infection of the lungs of dogs is neither enhanced nor diminished to any great degree by the state of allergy which results from a previous infection with virulent tubercle bacilli, when the infective inoculum is introduced by the bronchial route. Differences in the inherited resistance to TB. and in the size of the dose influence the results considerably.—A. BUXTON.

LAMONT, H. G., KERR, W. R., & PEARSON, J. K. L. (1945.) Northern Ireland. Investigation by the Veterinary Research Division, Ministry of Agriculture [1944-45]. Summer mastitis.—*Rep. agric. Res. Inst. N. Ireland, 1944-45.* pp. 15-16. 2217

A further experiment is reported on the possible control of summer mastitis by the inoculation of *Corynebacterium pyogenes* toxoid. The results were inconclusive, the vaccine reducing the incidence of the disease only and not effectively controlling it.—A. B.

VOGT, L. (1943.) Pseudotuberculose Herde im Gehirn von Schafen. [Pseudotuberculosis in the brain of sheep.]—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* June 25th. 203-205. 2218

In three sheep with symptoms of a brain disease small nodular lesions, two of them containing caseous material, were found in the brain. Although no abnormalities were seen in other organs, V. suggests that they were lesions of caseous lymphadenitis. No microscopic examination was made.—E. K.-N.

*SZABÓ, B. (1943.) [Erysipelothrix rhusiopathiae infection in pheasants.]—*Állatorv. Lapok.* 17, 100. [Abst. from abst. in *Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50, 35.] 2219

Among 560 six-month-old birds disease developed towards the end of August and at its height in the middle of November, 10-15 died daily. Bacteria identical with *Erysipelothrix rhusiopathiae* were cultured from the blood. The disease subsided completely with the beginning of frost and snow. It is assumed that

there were some carriers among the flock which fell ill during a spell of very hot weather; probably the disease was spread by the birds' droppings.—E. K.-N.

FELSENFIELD, O., & YOUNG, V. M. (1945.) The viability of salmonella on artificially contaminated vegetables.—*Poult. Sci.* 24, 353-355. 2220

The authors give details of the viability of *Salmonella pullorum*, *S. typhi-murium*, *S. montevideo* and *S. oranienburg* on 14 types of artificially infected vegetables. *S. pullorum* survived for 4-8 weeks on vegetables kept in cold store, and for 2-5 weeks when kept at room temperature. *S. typhi-murium*, *S. montevideo* and *S. oranienburg* survived for two weeks longer than *S. pullorum* when kept under similar conditions.

—A. BUXTON.

KAUFFMANN, F. (1941.) Über das Vorkommen von Salmonella-antigenen in Coli-Kulturen. [Occurrence of salmonella antigens in cultures of coliform organisms].—*Acta path. microbiol. scand.* 18, 225-246. [In German.] 2221

A number of *Bacterium coli* strains are described which possess antigens such as the O, H, and Vi antigens characteristic for salmonella cultures. It was shown that the Vi antigen of the examined *Bact. coli* strains was serologically identical with the Vi antigens of *Salmonella typhi*, *S. paratyphi C* and *S. ballerup*. In another strain that proved negative in a Vi-agglutination test the Vi antigen was demonstrated by absorption test. K. suggests the designations *Salmonella coli* 1, 2, 3, 4 and 5 for the described coli types and classifies them, together with the other salmonella types, in a table according to their antigens. He emphasizes that the *S. typhi*, *S. paratyphi* and *S. enteritidis* groups are not well defined, although useful for practical purposes, and that only single types can be clearly defined.

The term "para-agglutination" should be dropped, as it indicates only an agglutination due to antigens present in the bacteria concerned, and not, as assumed by some workers, to antigens acquired in the intestine of the diseased host.—E. KLIENEBERGER-NOBEL.

EDWARDS, P. R., & BRUNER, D. W. (1942.) Serological identification of salmonella cultures.—*Circ. Ky agric. Exp. Sta.* No. 54. pp. 35. 2222

This bulletin is divided into two main sections. The first deals with variational phenomena and includes short summaries of the H-O, S-R, V-W and phase variations. In addition there is a short note on the form variation of antigens I and XII. The second section deals with antigenic analysis: methods of preparing O, H and Vi sera are described, together with details of their use. There are some helpful data on the agglutinin absorption technique and on the determination of single O and H factors.

A short account of the biochemical reactions of some of the more common salmonella types is given, together with an up-to-date list of standard strains of salmonella available for distribution. The bulletin will be of great assistance to those who are engaged on the identification of salmonella strains.—A. BUXTON.

ANON. (1944.) Salmonella enteritidis infection with leg deformity in turkeys.—*J. Amer. vet. med. Ass.* 105, 139. 2223

A condition of acute inflammation of the hock joints in 900 turkeys 24 weeks old is described. *Salmonella enteritidis* was isolated from the heart blood and local purulent exudates.—A. BUXTON.

WILSON, J. E. (1945.) Infected egg shells as a means of spread of salmonellosis in chicks and ducklings. A preliminary note.—*Vet. Rec.* 57, 411-413. 2224
W. describes an outbreak of disease in young chicks

caused by a mixed infection with *Salmonella thompson* and *S. typhi-murium* and stresses that salmonella infection may be spread in a hatchery by the wiping and setting of contaminated eggs, the sexing of day-old chicks and by the dissemination of the organisms by mice: *S. thompson* was isolated from the intestines of some mice caught in a brooder house.

Fumigation with formaldehyde is recommended for the disinfection of eggs in an incubator. The limitations of the agglutination test for controlling infection in poultry and the danger to public health from the consumption of infected eggs are also discussed.—A. B.

MOORE, W. (1943.) North Carolina, a Bang's disease modified accredited area.—*Proc. 46th Meet. U.S. Live Stk sanit. Ass.*, 1942. pp. 114-119. 2225

The progress is described of the campaign against bovine brucellosis which extended over 15 years and resulted in North Carolina's becoming the first State placed on the accredited area list. The work was started experimentally in 25 herds and was extended as funds became available.

The progress of the work in each county from 1934 when Federal funds became available is detailed in tables. Pure-bred herds from which replacements were to be obtained were dealt with first. A law passed in 1937 made testing compulsory on a county wide basis. Compensation was paid at the rate of \$25 per head for good cattle and \$50 for pure-breds.

The value of calf vaccination was appreciated but the test and slaughter system was adopted as best suited to the local conditions.—M. C.

WIGHT, A. E. (1943.) Report of cooperative bovine brucellosis work in the United States.—*Proc. 46th Meet. U.S. Live Stk sanit. Ass.*, 1942. pp. 149-154. 2226

In the year ending the 30th June, 1942, 6,891,000 agglutination tests for brucellosis in cattle were performed, with 3% positive reactions. On the 1st November, 1942, there were 78,494 accredited herds, containing about one and a half million cattle located in 42 states. It is estimated that there was about 5% infection among cattle in the United States. The totals of nine half-yearly reports of the results of calfhood vaccinations, covering the 1st January, 1936, to the 1st January, 1942, included 17,608 calvings; results up to the fifth and sixth calvings are shown in a table. 552 abortions occurred, of which only 195, or 1.1% of the total calvings, could be attributed to brucellosis.

—S. J. GILBERT.

RABSTEIN, M. M., & CORTON, C. (1943.) Bang's disease immunity tests and a new vaccination method.—*Proc. 46th Meet. U.S. Live Stk sanit. Ass.*, 1942. pp. 129-136. 2227

The results of 2,200 opsonocytaphagic and agglutination tests on 438 cattle are described. The tests were made according to the technique described by Huddleson.

It is concluded that while the opsonic index may be a measure of immunity, controlled exposure tests are necessary before definite conclusions can be drawn.

Some experiments on intradermal vaccination with strain 19 vaccine using a dose of 0.2 ml. are referred to. These experiments are not completed but it was shown that the agglutination titre in cows following intradermal vaccination with 0.2 ml. was as high as that which followed subcutaneous vaccination with 5 ml.—M. C.

SEELEMANN, M. (1943.) Die neuen Bestimmungen über die Schutzimpfung mit lebenden Kulturen gegen das seuchenhafte Verkalben (Banginfektion) des Rindes. [Live vaccine for bovine brucellosis].—*Tierärztl. Rdsch.* 49, 64-68. 2228

S. discussed the then new regulations allowing vaccination against bovine brucellosis with live cultures of all districts of the German Reich. The regulations do not limit the choice of strains used for the production of vaccines, as in other countries where only certain strain types were allowed. No instructions were issued concerning the density of the suspensions, but the time of usage was limited to two weeks after preparation. The effect of the new regulations would be to ensure vaccination on a larger scale than ever before in Germany.

Two main problems remained to be solved, viz., whether the use of virulent cultures would be harmless and whether the protection would last for at least three vaccination periods.—E. KLIENEBERGER-NOBEL.

SMITH, H. R. (1943.) The control of Bang's disease in relation to the conservation of meat and dairy products.—*Proc. 46th Meet. U.S. Live Stk sanit. Ass.*, 1942, pp. 144-148. 2229

S. emphasized the need to conserve meat and dairy products because of wartime conditions; calf vaccination with strain 19 was being extensively undertaken. The special difficulties arising in California were discussed. State co-operation was given in four different methods of control.—S. J. GILBERT.

(1943.) Report of the committee on Bang's disease [U.S. Live Stock Sanitary Association].—*Proc. 46th Meet. U.S. Live Stk sanit. Ass.*, 1942, pp. 155-157. 2230

Continued progress in the control and eradication of brucellosis in cattle is reported. Some 15 million head have been under official supervision and 1½ million fully accredited as free from contagious abortion. Twenty counties are qualified as modified accredited disease-free areas. In December, 1940, calfhood disease was incorporated as an aid to control.

—S. J. GILBERT.

EMPELL, A. D., & RODWELL, A. W. (1945.) The relationship of dosage and site of inoculation to the agglutinin response to *Brucella abortus* strain 19 vaccine: a comparison of the subcutaneous, intracutaneous and intracaudal routes.—*J. comp. Path.*, 1945, 55, 277-289. 2231

The authors examined and compared reactions in cattle inoculated with strain 19 by different routes. They assume that the agglutination reaction may be used as a measure of the immune response, but the validity of this assumption has not yet been tested. The highest titres were obtained by the inoculation of 0.1 ml. intracaudally. 0.2 ml. or even 0.04 ml. produced responses as high as 5 ml. given subcutaneously or 0.2 ml. given intracutaneously. After subcutaneous inoculation local reactions were frequently considerable, but after intracaudal or intracutaneous inoculation they were unimportant or transient. Strain 19 was not found in mammary secretion of cows vaccinated subcutaneously or intracaudally.—S. J. GILBERT.

RYD, W. L., KERNKAMP, H. C. H., ROEPKE, M. H., & BLYE, C. E. (1943.) Incidence of brucellosis in swine.—*Proc. 46th Meet. U.S. Live Stk sanit. Ass.*, 1942, pp. 124-128. 2232

The authors compare the results in different herds of swine of agglutination tests carried out with the same standard antigens and technique as are used for cattle. They consider that not all animals showing a titre of 1:50 should be regarded as infected.

—S. J. GILBERT.

BLITSKIY, T. M. (1941.) Klinicheskaya, bakteriologicheskaya i sero-allergicheskaya diagnostika brutselleza i shchadei. [Clinical, bacteriological, serological, and allergic diagnosis of brucella infection

in horses].—*Trud. XV Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939. [Diseases of Horses.]* pp. 115-117. 2233

Observations were made on six horses artificially infected with various strains of brucella, on 93 horses exposed to natural infection and on one horse with naturally acquired infection and fistulous withers.

The clinical course was sometimes latent without marked changes in the blood morphology. Agglutinins were present 5-15 days after infection and disappeared after 81-110 days. Complement-fixing bodies were present within 5-17 days and disappeared within 25-100 days. In the naturally infected horses, the c.f. test remained positive over six months. Antigens prepared from single brucella strains varied in their activity. Antigens from *Br. bovis* and *Br. suis* varieties were more active than those from *Br. melitensis*. Bacteriological examination of faeces, urine and blood cultures from experimentally infected horses yielded negative results. The ophthalmic test [see AVVAKUMOV—V. B. 15. 73] remained positive for five months in artificially infected horses.—A. MOLDAWSKY.

CILLI, V., & ANDOLFATO, A. (1943.) Primi dati sulla diffusione dell'infezione brucellare negli ovini e caprini dell'Eritrea. [Brucellosis in sheep and goats in Eritrea].—*Boll. Soc. ital. Med. Ig. trop. (Ses. Eritrea), Asmara*, 2, No. 3. Reprint pp. 5. 2234

To investigate the incidence of brucellosis in Eritrean sheep and goats, the authors tested animals subcutaneously in the eyelid with brucellin prepared from *Brucella abortus* and *Br. melitensis*. Positive reactors were then submitted to the agglutination test.

Of 1,817 goats, 74 gave positive reactions to the brucellin test and of these 34 reacted positively to the aggl. test. Of 1,115 sheep, 69 were positive reactors to brucellin, and three of these reacted positively to the aggl. test. Abortions are said to be rare in the sheep and goat in Eritrea, and usually to be due to feeding deficiencies or traumatism.—I. W. JENNINGS.

JORDAN, C. F. (1943.) Undulant fever in Iowa.—*Proc. 46th Meet. U.S. Live Stk sanit. Ass.*, 1942, pp. 137-143. 2235

During the period 1926-41, 2,229 cases of undulant fever were officially notified in Iowa. Males have been more frequently infected than females owing to their closer contact with infected animals. The hazard of exposure is greatest in packing house workers and cases occur most frequently from June to August. Two milk-borne epidemics were found to be due to *Brucella suis*.

—S. J. GILBERT.

JORDAN, C. F., BORTS, I. H., HARRIS, D. M., & JENNINGS, J. R. (1943.) Brucellosis: a consideration of its epidemiology, diagnosis and control.—*Amer. J. publ. Hlth*, 33, 773-779. 2236

The authors give details of two cases of milk-borne brucellosis in Iowa. The first was caused by *Brucella abortus* and the second by *Br. suis*. The economic importance of this disease and the necessity for pasteurizing all dairy products are stressed.—A. BUXTON.

TURNER, A. W., & EALES, C. E. (1944.) The δ haemolysin of *Clostridium Welchii* Type C. I. A characteristic haemolytic reaction of *Cl. welchii* Type C on ruminant blood agar.—*Aust. J. exp. Biol. med. Sci.*, 22, Part III, 215-221. 2237

This article describes a characteristic haemolytic reaction given by *Cl. welchii* Type C on ruminant blood agar. On suitable agar media containing 10% of ruminant (ox, goat or sheep) blood, colonies of this organism are surrounded by the narrow zone of complete haemolysis, common to the four Wilsdon types, and an outer wider zone of almost complete haemolysis.

which distinguishes them from the colonies of Types A, B and D.

This characteristic zone of almost complete haemolysis is inhibited by mixtures of anti- α , anti- θ and anti- β sera but not by mixtures of anti- α and anti- θ sera which will inhibit the haemolysis around colonies of Types A, B and D. Evidence therefore points to its being caused by δ -haemolysin.

This reaction greatly facilitates the recognition of *Cl. welchii* Type C.—N. WICKHAM.

DIENES, L. (1945). Morphology and nature of the pleuro-pneumonia group of organisms.—*J. Bact.* 50. 441-458. 2238

D. describes his methods for the demonstration of pleuropneumonia-like organisms. He attempted to show a similarity, contested by some workers, in the morphology and life cycle of bacteria and the microbes belonging to the so-called pleuropneumonia group of organisms. This similarity is one of shape and of development. In both groups of microbes small forms that show as "bipolar bacilli" are considered to occur and the conspicuous large forms so frequent in the pleuropneumonia group when grown on solid media are considered to correspond to large forms found in various strains of bacteria. In both groups of organisms, these large forms have, according to D., a similar reproductive function.

It is assumed that the pleuropneumonia group of organisms fits into the system of bacteria near the genera *Pasteurella* and *Haemophilus*.—E. K.-N.

GREGORY, P. H. (1945). The dispersion of air-borne spores.—*Trans. Brit. mycol. Soc.* 28. 26-72. [Abst. in *Rev. appl. Mycol.* 24. 378, copied *verbatim*.] 2239

In this paper the author examines in detail the nature and magnitude of the factors that control the scattering of air plankton, reviews the literature of the subject in order to ascertain whether the observed distributions of plant pathogens follow recognizable patterns, and finally discusses the application of the subject to the study and prevention of air-borne diseases of field crops.

The conclusions reached may be summarized as follows. The deposition of air plankton, such as passively air-borne pollen grains or fungal spores, decreases with increasing distance from a given source. The terminal velocities of spores depend on their size,

and are roughly what may be expected for smooth, spherical particles from Stokes's law, but moderately wide deviations between observed and expected values are probably due to surface roughness and asymmetry. Fungal spores fall at velocities between 0.04 and 2.5 cm. per sec. and pollen grains at velocities about 300 cm. per sec. Attempts to calculate the dispersal of spores as the resultant of vertical fall and gravity and horizontal wind movement apply only to non-turbulent air movement, and are inapplicable at more than a few mm. above the earth's surface. Differences in rate of spore fall are probably not major factors in dispersal. It is more appropriate to consider a spore cloud in suspension in the air in process of dilution by eddies in the course of its transport by the wind.

In support of the concept of the spore cloud as a suspension it is shown that at heights in the atmosphere above the surface layers, the concentration of pollen would be expected if articles falling under gravity were balanced by other particles diffused upwards by eddies. The values for eddy diffusivity, K , varying from 1.5×10^4 to 3.3×10^4 , deduced for spores and pollen, are of the order usually found in meteorological work.

Terminal velocity, while it may play only a small part in spore dispersal may be more important in causing deposition of spores brought down by eddies to the boundary layer of relatively still air a few cm. thick at the earth's surface.

Based on Sutton's theory of eddy diffusion, equations are given for the deposition of spores at various distances from a point source, while from Stepanoff's data it is concluded that in travelling across 1 sq. cm. of surface there are deposited the equivalent of the number of spores present in a layer on the axis of the cloud about $\frac{1}{2}$ mm. thick. This value is expressed as a coefficient of deposition, p , and is regarded as a parameter of much biological significance. Observed gradients of air-borne plant infections originating from a point source are shown to be closely predicted by the deposition theory, while splash-dispersed fungi show gradients incompatible with it. An approximate formula is given for gradients from strip sources, and observed gradients show reasonable agreement.

The significance for plant hygiene of this work is that while attention should be paid to isolation, most emphasis should be placed on eliminating foci of infection within a crop.

A list of 89 bibliographical references is appended.

See also absts. 2305, 2409 (streptococci), 2242 (arthrax), 2273, 2274, 2360, 2361, 2391, 2393, 2394, 2418 (TB.), 2296 (corynebacteria), 2362 (glanders), 2388 (*Pseudomonas*), 2389, 2390 (*Bact. coli*), 2296, 2289-2291 (*Chromobact. prodigiosum*), 2296 (actinobacillosis), 2351-2366 (antibiotics).

DISEASES CAUSED BY PROTOZOAN PARASITES

KLEINE, F. K. (1943). Trypanosomenkrankheiten der Haustiere und des Menschen. [Trypanosomiasis of animals and human beings.]—*Dtsch. tierärztl. Wschr.* 51. 119-120; *Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 51/49. 39-40 & 79-80. 2240

A general account is given of the problems of animal and human trypanosomiasis, with an extended historical survey of the advance of knowledge on these subjects, the work of German scientists being particularly stressed.

The treatment of bovine trypanosomiasis and the immunization of cattle are discussed, some success being claimed for the methods of immunization by infection with mild strains of trypanosomes or exposure to infection in youth, but it is admitted that in most cases immunity breaks down, often as a result of infection with another species of trypanosome. The control of human trypanosomiasis is dealt with at some length

and the relationship of *T. rhodesiense*, *T. gambiense* and *T. brucei* is discussed, the view being expressed that *T. rhodesiense* is descended from *T. gambiense*.—U. F. R.

•ÜLLMANN, E. (1942). Tsetsefliegen und Trypanosomen-Entwicklung. [Tsetse flies and trypanosomes.]—*Tropenhyg. Schr.* 1942. pp. 5-33. [Abst. from abst. in *Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* July 7th. 225, (1944).] 2241

A summary is given of the latest entomological information on tsetse flies, particularly with regard to the development of polymorphic trypanosomes in species of *Glossina*. Strains of *T. gambiense* from a monkey, *Cercopithecus galeries agilis*, proved much more infective to *G. palpalis* than strains maintained in g. pigs; it is suggested that the mammalian host may be important in conditioning the virulence of a trypanosome strain.—U. F. RICHARDSON.

ALDONADO, G. (1944.) Reactivación hematozoárica en bovinos en la fase negativa con espora-vacuna en solución glicerínada al 50%. [Reactivation of piroplasmosis and anaplasmosis in cattle as a result of inoculation with anthrax spore vaccine.]-*Rev. Med. vet., Bogotá*. 13. 60-67. 2242

Of some 400 cattle immunized against anthrax with spore vaccine, nine developed infections with either *Anaplasma* or *Babesia argentina*, which were assumed to be due to a stimulation of latent infections by the anthrax vaccination. Cases of anaplasmosis were treated with neosarsphenamine (neosalvarsan), 3 g. being given intravenously, and those of piroplasmosis with 1 ml. of a 2% solution of acriflavine, also given intravenously.

Two of the animals died and in both cases anthrax bacilli were present in the heart blood. It is suggested that on the relapse to the protozoan infection stimulated the virulence of the anthrax organisms introduced in the vaccine.—U. F. RICHARDSON.

BRION, A. (1944.) L'anaplasmose du cheval et son parasite causal. [Anaplasmosis in horses.]-*C. R. Soc. Biol. Paris*. 138. 537-539. 2243

BRION, A. (1944.) Transmission expérimentale de l'anaplasmose du cheval. [Experimental transmission of equine anaplasmosis.]-*Ibid.* 539-540. 2244

I. A disease of horses is recorded as having occurred in the Haute-Savoie since 1941, being most prevalent in late summer and autumn. It is characterized by febrile attacks lasting a few days, separated by periods of normality lasting 1-4 weeks. During the febrile periods the animal shows severe prostration and the mucous membranes are subicteric, but anaemia does not always occur. The urine contains albumin and small quantities of bilirubin. In acute cases the animal sometimes dies in the first febrile attack, but may survive nine attacks and even apparently recover. The disease is distinguished from equine influenza by the intermittent character of the fever and its failure to respond to neosarsphenamine treatment, from infectious anaemia by the absence of anaemia and by the maintenance of condition and vigour between the attacks, and from piroplasmosis by the relapses which are rare in piroplasmosis and by its failure to respond to treatment (acriflavine). Piroplasms have never been seen in smears from affected animals, but bodies resembling anaplasmas occur, staining a purplish blue with May-Grünwald-Giemsa stain.

It is pointed out that anaplasmod bodies in equines have been recorded in Russia by YAKIMOV and KOSELINKIN and in the Nile valley by BALFOUR, but in both cases they were associated with *Babesia equi*.

II. The successful transmission of anaplasma to horses is recorded. Blood taken from a horse after the third febrile attack was defibrinated and 18 hours later the corpuscles were removed by centrifugation, suspended in saline and inoculated intravenously into another horse. On the 24th day this animal was found in a state of prostration, and it died four days later. Anaplasma bodies were found in the blood. It is pointed out that Jolly bodies are not transmissible by inoculation and are always associated with other evidence of anaemia and that though anaplasmod bodies occur in equine piroplasmosis particularly in the later stages, sub-inoculation of blood from a case of piroplasmosis will result in the appearance of typical besen forms. The name *Anaplasma equi* n. sp. is given to the organism described.—U. F. RICHARDSON.

NON. (1945.) African coast fever.—*Rhod. agric. J.* 42. 398-403. 2245

In discussing the claim that East Coast fever has become enzootic in certain areas of Southern Rhodesia, it is pointed out that the disease appears to have been introduced from Tanganyika in 1901, and to have been spread throughout the colony by transport cattle, causing a loss of some 50% of the European cattle. In the early days some herds were saved by the slaughter of febrile animals and the movement of the remainder to clean grazing, thus eliminating infected ticks. At a later period short-interval dipping, combined with the slaughter of cattle with fever, the smears from whose lymph nodes were positive upon microscopic examination, resulted in the greater part of the country being cleared of the disease which was thus proved unable to establish itself enzootically in most areas.

As an example of the position in areas in which the disease has persisted for 40 years, an analysis is made of the outbreaks in the Melsetter district; it is pointed out that out of 84 infected premises 54 were cleared after one outbreak. Records of outbreaks on the other infected farms suggest that on one the disease persisted from 1906-31, but the extent of this farm favoured the practice of moving cattle from one part to another and it is suggested that such movements prevented any serious outbreak although infection persisted in the tick population. Whilst repeated outbreaks have occurred on some of the other farms, there is evidence of only very limited persistence of infection, the majority of the secondary outbreaks appearing to be due to the reintroduction of disease from neighbouring premises.—U. F. R.

ENIGK, K. (1944.) Das Vorkommen der Hundepiroplasmose in den besetzten Ostgebieten. [Canine piroplasmosis in German-occupied Eastern Europe.]-*Dtsch. tropenmed. Z.* 48. 88-93. 2246

In view of the absence of known transmitters of canine piroplasmosis in areas of Russia in which the disease appears to exist, attempts were made to transmit *Babesia canis* by *Dermacentor pictus*, *Hyalomma marginatum* and *Ixodes ricinus*. Successful transmission was obtained with *D. pictus* between the nymphal and imago stages, and with *H. marginatum* between the larval and nymphal stage, and the nymphal and imago stage. Transmission with *Ixodes ricinus* was unsuccessful. The strain of *B. canis* used was sent from Germany where it had been maintained by transmission through *Rhipicephalus sanguineus*. It is pointed out that this strain proved transmissible by three different genera of ticks, and that this lack of specificity as regards its intermediate host is opposed to the theory of REICHENOW, who suggested that several species of canine piroplasms existed, being distinguished from each other by their specificity to the vector tick.—U. F. RICHARDSON.

HAMMOND, J. (1945.) "Constitution" in cattle in relation to pests and disease.—*Ann. appl. Biol.* 32. 278. 2247

This short summary of present knowledge concerns the relation between "constitution" in cattle and their resistance to pests and diseases and is based almost entirely upon what is known of the difference in behaviour between European and zebu cattle in tropical countries. H. concludes that the high resistance of zebu breeds of cattle to piroplasmosis as compared with that of European breeds is due not to any breed immunity to infection but to the fact that zebu cattle have some property which repels ticks and so reduces the degree of tick infestation [but see KELLEY (*V. B.* 16. 90) who reports very high resistance to artificial infection with piroplasmosis in clean zebu cattle imported into Australia from tick-free areas in America]. The degree of tick infestation is said to regulate the intensity of piroplasmosis infection. The higher

resistance shown by zebu cattle to the effects of piroplasmiasis is considered by H. to be due to the better nutritive state of the body consequent on their better power of heat regulation.—M. C.

JOHNSON, E. P. (1945.) Blood parasites of turkeys. —*M[ich.] S[ci.] C[oll.] Vet.* 5. 145-146 & 174. 2248

Haematozoa of turkeys are becoming increasingly important. J. points out that serious losses among turkeys result from infections with blood protozoa, especially with the leucocytozoa. *Leucocytozoon smithi*, the species here concerned, is transmitted by various species of blackfly: *Simulium occidentale*, *S. nigroparvum*, and *S. slossonae*. The primary factors that influence the feeding activities of the flies are temperature, air currents and atmospheric pressure. Maximum feeding was found to take place at temperatures of 75°-85°F. and flies were found to feed at humidities as low as 2% and as high as 89%. At low atmospheric pressures, or after rapid falls in pressure, the flies showed greatest activity in feeding. Strong winds did not favour feeding. A study of the life-cycle of *L. smithi*, as it occurs in turkeys and in *S. nigroparvum*, shows that macro- and microgametocytes are taken into the stomach of the fly while it is engorging. Gametes are produced and after fertilization the resulting zygote becomes a motile ookinete which eventually rounds up to form an oocyst. Sporozoites are eventually released and make their way to the salivary glands of the fly. The sporozoites are passed to the turkey during biting and in the plasma they develop into gametocytes. Preventive measures include raising young turkeys in confinement in screened houses and disposing of all adult

breeding turkeys that are apt to be carriers. Other and less important blood parasites include *Haemoproteus* sp., *Plasmodium* and spirochaetes.—C. HORTON SMITH.

GREENE, M. R. (1945.) The influence of amino acids on the growth of *Leptospira canicola*.—*J. Bact.* 50. 39-45. 2249

Experiments were undertaken to ascertain whether amino acids could be substituted for serum in media used for the cultivation of *L. canicola*. None of the amino acids tested accelerated growth when added to Schüffner's medium, and alanine, arginine, glutamic acid, glycine, lysine, methionine, tyrosine and valine caused a significant decrease in growth.—U. F. R.

PETERSEN, C. B. (1944.) Saxkoebing, ein neuer serologischer Leptospiratyph. [*Leptospira saxkoebing*, a new type.].—*Acta path. microbiol. scand.* 21. 165-180. [In German.] 2250

Investigations into the antigenic characteristics of a leptospira isolated in Denmark from a species of field mouse, *Apodemus flavicollis*, revealed that it was related to *L. hebdomadis* and *L. sejroe* and was identical with a species isolated in Italy whose characteristics had not been fully determined. This species is now named *L. saxkoebing*. It has slight pathogenicity for g. pigs and man.

The species of *Leptospira* recorded in Europe are recapitulated, and it is pointed out that the position of the Russian species *L. icterohaemoglobinuriae*, of cattle, has not been fully investigated and that it is not known whether it is related to organisms which have been isolated from cases of haemoglobinuria in man.

—U. F. RICHARDSON.

See also absts. 2363, 2364, 2418 (trypanosomiasis), 2365-2369, 2280 (piroplasmiasis).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

TUTTON, E. A. (1946.) An outbreak of foot-and-mouth disease in Austria.—*J. R. Army vet. Cps.* 17. 103-105. 2251

This is a short report of F. & M. disease in 1945 in Styria and Carinthia. The type of the strain or strains involved was not determined.—W. M. H.

LÄGEL. (1943.) Darf ein Tierheilkundiger Gehöfte, die mit Maul- und Klauenseuche verseucht sind oder in solchem Verdacht stehen, ohne ortspolizeiliche Genehmigung zum Zwecke der Behandlung der Tiere betreten? [May a veterinary surgeon visit farms infected with foot and mouth disease for the purpose of treating the animals, without permission from the local police?].—*Berl. Münch. tierärztl. Wschr.* [Wien. tierärztl. Mschr.] April 2nd. 98-99. 2252

A comment by a barrister on the above question following a court decision that a veterinary surgeon is not entitled to enter infected premises without permission.—W. M. HENDERSON.

MANNINGER, R. (1943.) Die Aujeszkysche Krankheit. [Aujesky's disease.].—*Berl. Münch. tierärztl. Wschr.* [Wien. tierärztl. Mschr.] July 9th. 211-215. 2253

In this general article on Aujesky's disease the diagnosis, epidemiology, mode of transmission and the characters of the virus are discussed.—W. M. H.

I. HECKE, F. (1943.) Epidemiologische Beobachtungen über Tollwut, besonders beim Wild. [Epidemiology of rabies in wild animals.].—*Dtsch. tierärztl. Wschr.* [Tierärztl. Rdsch.] 51/49. 305-309. 2254

II. MÜSSEMEIER. (1944.) Inwieweit können übertragbare Tierseuchen unter dem Wild, insbesondere

die Tollwut unter Füchsen und Dächsen, mit dem im Viehseuchengesetz vorgesehenen Massnahmen bekämpft werden? [Control of infectious diseases of wild animals, especially rabies in foxes and badgers.].—*Ibid.* 52/50. 9-10. 2255

I. This contribution on the epidemiology of rabies is based on experience gained in the control of rabies in North-West Poland during the German occupation. During and after the invasion of Poland in 1939 the conditions pertaining to a war-devastated country, especially the presence of large numbers of ownerless cattle and many stray cats and dogs, favoured outbreaks of rabies. This situation was improved with the restoration of order and by the destruction of all stray cats and dogs the remainder of the dogs having to be muzzled and kept under control. The canine population was further reduced making it illegal for any farmer to keep more than 1-2 dogs, according to the size of his holding. As a result of this order, many thousands of dogs were destroyed, e.g., 18,000 in the sub-province of Danzig. Although these measures reduced the incidence of rabies, outbreaks still occurred in some districts, especially in the more wooded parts of the country. Following the detection of rabies in two foxes and a badger in 1941, attention was directed towards these animals, an increasing number being found to be affected with rabies; in the Danzig sub-province in the first four months of 1943, for example, 67 cases of rabies were detected, affecting six dogs, three cats, one cow, one sheep, 54 foxes and two badgers. There appeared to be no doubt that the existence of the disease in foxes and badgers accounted for the recurrence of outbreaks in domestic stock and H. recommends that the numbers of these wild animals

be reduced in affected districts as part of the plan for the control of rabies.

II. M. uses the evidence put forward in I to justify the official German policy for the control of rabies and points out that it includes the offering of a monetary reward for foxes and badgers caught at the direction of the veterinary police in specified areas during outbreaks.—W. M. HENDERSON.

BUZENAC, J. (1943.) Sur la présence d'éléments corpusculaires à l'intérieur des globules rouges, des chiens et des chats atteints de certaines maladies infectieuses. [Corpuscular elements in erythrocytes of dogs and cats affected with certain infectious diseases.]—*Bull. Acad. vét. Fr.* 16, 349-352. 2256

Attention is drawn to the occurrence of very small fuchsinophilic bodies in the red blood cells of dogs and cats affected with certain infectious diseases, e.g., distemper and acute and chronic types of infectious anaemia of dogs, influenza, infectious laryngitis, contagious coryza and encephalitis of cats. The existence of these extra-corpuscular bodies is revealed when blood smears are treated with Ruge's fluid to remove haemoglobin without destruction of the cell envelopes and then stained with diluted Ziehl's fluid which stains the elements a brilliant scarlet, purple or ruby colour. The fixing and staining techniques are described in detail. Success in any preparation is largely determined by the care taken in fixing and the efficiency with which haemoglobin is removed.

The bodies show marked polymorphism and variation in size, the smallest being grains at the limit of visibility. They correspond to no known parasite or well-defined histological element. They are definitely intracellular and are not seen in preparations from which haemoglobin has not been removed. Occasionally a few bodies may be seen attached to the membranes of polynuclears, as if on the point of entry, and others already within the cytoplasm. Such pictures are considered to present those of classical phagocytosis.

The bodies are always completely absent from similar preparations made from the blood of healthy subjects. Some possibilities as to their nature and origin are indicated in the form of a series of questions.

—W. R. MUIR.

BRION. (1945.) Une maladie sans doute fréquente et méconnue: la leucopénie infectieuse des chats. [Infectious leucopenia of cats.]—*Rev. Path. comp.* 45, 369-371. 2257

B. describes an infectious condition of young cats said to be distinct from feline gastro-enteritis and feline distemper and for which the name "infectious leucopenia of cats" is suggested. [For a full account of this disease reference should be made to the work of HAMMON & ENDERS, see *V.B.* 9, 625.]—W. M. H.

— (1945.) Australian Veterinary Association, Victorian Division. [Symposium on virus diseases of poultry.]—*Aust. vet. J.* 21, 49-50. 2258

The symposium resolved itself into a discussion of infectious laryngo-tracheitis. The need for rapid diagnosis and its difficulty on clinical grounds alone were stressed. Egg-grown-virus vaccine used within three days of its preparation has given good results in the field.—L. HART.

ANDERSON, S. G. (1946.) A note on two laboratory infections with the virus of Newcastle disease of fowls. —*Med. J. Aust.* March 16th, 371. 2259

Two cases of conjunctivitis in laboratory workers are described from which the virus of Newcastle disease was isolated by allantoic inoculation of conjunctival fluid. Infection in one case was due to splashing with egg-grown virus. In both cases the disease was mild

and soon cleared. There was no significant rise in serum antibody. In a previous case in the same laboratory the conjunctivitis was more severe and headache and malaise were noted, but again recovery was rapid. —L. HART.

ORR, W., & JOHN, K. T. (1946.) A Malaysian virus disease of fowls.—*Vet. Rec.* 58, 117-119. 2260

A virus disease which has been the cause of very heavy mortality in Malaya over a period of years is described.

The disease resembled Newcastle disease but preliminary investigations indicated that it differed from it in two important characters, *viz.*, in that diphtheritic lesions of the mouth and larynx were a constant feature and in that the virus was non-pathogenic, or only very slightly pathogenic, for pigeons. At that stage the name diphtheritic stomato-pharyngitis was used.

Later investigations showed however that the mouth lesions were not a constant feature of all outbreaks, that the virus was immunologically identical with an English strain of Newcastle disease virus and that pigeons could be infected. The symptoms and lesions are described.—M. C.

BEACH, J. R. (1944.) The neutralization *in vitro* of avian pneumoencephalitis virus by Newcastle disease immune serum.—*Science.* 100, 361-362. 2261

Pneumo-encephalitis virus, when propagated in embryos or rapidly passed through a series of chickens, became so highly virulent that an attempt was made to determine its possible relation to the viruses of Newcastle disease or fowl plague, neither of which diseases had been reported in the U.S.A. A small quantity of antiserum for each virus was obtained from England and used for *in vitro* neutralization tests with pneumo-encephalitis virus.

Mixtures prepared from equal parts of serum, undiluted or diluted with saline, and embryo-cultured virus were injected intramuscularly in doses of 0.1 ml. into chickens 61 days old. Chickens were not infected by inoculation with 1,000 infective doses of pneumo-encephalitis virus when it was mixed with an equal quantity of Newcastle disease-immune serum, whether undiluted or in dilutions of 1:10 or 1:100. The virus was not affected, however, by mixing it with the fowl plague immune serum.

It was considered that these results indicated that the virus of pneumoencephalitis is immunologically identical with the virus of Newcastle disease.—J. D. B.

MELAMED, A., & FINE, J. M. (1944.) Ornithotic pneumonia.—*Amer. J. Roentgenol.* 51, 548-554. 2262

The authors describe three cases in human beings of so-called atypical pneumonia, all of which showed the presence of psittacosis complement-fixing antibodies in the serum.—W. M. HENDERSON.

FLORMAN, A. L. (1945.) The use of a commercially available complement-fixing antigen for the diagnosis of elementary body types of viral infection.—*J. Immunol.* 51, 29-37. 2263

The group of virus diseases including psittacosis, ornithosis, lymphopathia venereum, inclusion blenorhoea and trachoma stimulates the formation of antibodies which fix complement in the presence of the virus of either psittacosis or lymphopathia venereum. A commercial antigen for the c.-f. test known as "Lygranum CF" Squibb and recently introduced contains large quantities of lymphopathia virus. The basis of the work recorded is a study of this antigen in the differential diagnosis of venereal and respiratory diseases caused by elementary body viruses. F. found the diagnostic value to be proportional to the sensitivity and specificity of the antigen; 228 sera tested from

selected groups of patients gave disappointing results in both respects. The cross serological reactions of this group of elementary body viruses limit its application and leave the ultimate determination to clinical observation. In these tests F. found that 28.6% of control sera were positive. He concludes that in the differential diagnosis of these venereal and respiratory diseases by the testing of a single specimen of serum, the "Lygranum" antigen now available is of doubtful diagnostic value.—W. R. KERR

TOPPING, N. H., BENGTSON, I. A., HENDERSON, R. G., SHEPARD, C. C., & SHEAR, M. J. (1945.) Studies of typhus fever.—*Nat. Inst. Hlth, U.S. publ. Hlth Serv. Bull.* No. 183. pp. 110. 2264

This compilation of nine progress reports describes work carried out during the years 1942-44 by the rickettsia unit of the Division of Infectious Diseases of the National Institute of Health, U.S.A., to investigate the possible means of improving the antigenicity of typhus vaccines.

The available epidemic typhus vaccines were studied and details are given on the preparation of improved vaccines. The complement-fixation test, the neutralization test in mice and the precipitin test are discussed in relationship to the antigenicity of various strains of typhus virus and to the immunity and antibody response induced by epidemic typhus vaccines.

—F. R. BELL.

TATLOCK, H. (1944.) A rickettsia-like organism recovered from guinea pigs.—*Proc. Soc. exp. Biol., N.Y.* 57. 95-99. 2265

G. pigs inoculated intraperitoneally with blood drawn from a case of pretibial fever of man developed a febrile reaction with an exudative peritonitis and splenomegaly. Rickettsia-like bodies were detectable in impression preparations of the spleen, chiefly intracytoplasmic, and in the peritoneal exudate, mostly extracellular. The organisms occurred as small bacillary forms, tending to be paired and often clumped. They were larger than *Pasteurella tularensis* and the known rickettsiae. Cultivation in artificial media failed, but was successful in eggs, the predilection site being the yolk-sac. Recovered g. pigs developed immunity and were positive to complement-fixation tests, but humans recovered from pretibial fever failed to show complement-fixing or agglutinating antibodies. It is pointed out that the organisms may not have been derived from the case of pretibial fever. Pretibial fever is a new disease of man occurring in North Carolina and characterized by splenomegaly and a maculo-papular eruption confined to the legs.—U. F. RICHARDSON.

ENIGK, K. (1944.) Die Rickettsiosen der Haustiere.

See also absts. 2370 (equine infectious anaemia), 2371, 2372 (fowl plague), 2405 (rabies), 2416 (swine fever in Grenada).

[Rickettsias of domestic animals.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 335-366 & 375-376. 2266

The view is accepted that a definition of *Rickettsia* is not yet possible and that the rickettsia of both animals and man differ considerably from each other; whilst some authorities consider certain inclusion bodies as rickettsia others classify them as viruses.

The animal rickettsia are described under the headings of endothelial rickettsias (heartwater), leucocytic rickettsias (*R. canis*, *R. bovis*, *R. ovis* and an unnamed organism of swine) and epithelial rickettsias (*R. conjunctivae*). A section is also included on the pathogenic rickettsia of man which animals may harbour.

[The article is a concise compilation of the information available on these infections, but contains nothing original.]—U. F. RICHARDSON.

RAKE, G., ALEXANDER, R., & HAMRE, D. M. (1945.) The relationship of the agent of heart-water fever—*Rickettsia ruminantium*.—*Science*. 102. 424-425. 2267

Although *R. ruminantium* is normally transmitted by ticks, its susceptibility to sulphonamide chemotherapy suggests its relationship to the lymphogranuloma-psittacosis group of organisms. The preponderance of ring forms in intima smears and the bacillary forms which have also been described, distinguish the organism from the lymphogranuloma-psittacosis group. The sera of sheep with heartwater do not contain antibodies capable of fixing complement in the presence of lymphogranuloma antigen. It is suggested that *R. ruminantium* is related to both the rickettsia and the lymphogranuloma-psittacosis organisms.—U. F. R.

ANON. (1943.) La réaction de Weil-Félix chez les chiens de Brazzaville. [The Weil-Félix reaction in dogs in Brazzaville.]—*Rapp. Inst. Pasteur, Brazzaville*, 1943. pp. 87-88. 2268

In a study of the role of dogs in human infection with typhus, the sera of 46 dogs were examined for agglutinins. Most of the dogs came from two villages close to Brazzaville but a few of them belonged to Europeans who had recently had fever with a rash resembling that of typhus.

Seven of the dogs gave positive results. Agglutinins against *Proteus* OX19 were present in five dogs, against OX2 in four, against OXK in three and against OXL in one. The titres varied from 1:50 to 1:100.

It is concluded that infection of the *boutonneuse* type in dogs can stimulate the formation of agglutinins for the various strains of *Proteus*. This is considered to be confirmatory evidence for the view that dogs may serve as a reservoir of the virus of the *boutonneuse* type in Central Africa.—M. C.

IMMUNITY

WRIGHT, G. G. (1945.) Studies on the denaturation of antibody. II. The effect of protein concentration on the rate of denaturation of diphtheria antitoxin by urea.—*J. exp. Med.* 81. 647-653. [For part I, see V. B. 14. 416.] 2269

Although in a previous study W. showed that diphtheria antitoxin was inactivated by urea, the exact nature of the reaction was not fully understood; the present paper describes further experiments on the effect of protein concentration upon the denaturation of diphtheria antitoxin by urea, as measured by the Römer intracutaneous neutralization method and by quantitative precipitation titration.

Results by the first method showed that the rate of denaturation of the antitoxin in urea solution, as measured by its neutralizing power over toxin, did not depend upon the initial concentration of protein. But the amount of precipitate obtained in the quantitative precipitation test with toxin increased with increasing amounts of protein during denaturation. It is suggested that the protein concentration is of greatest importance during the time when the urea is being dialyzed from the solution.—J. C. BUXTON.

RAMON, G. (1943.) Considérations sur les anatoxines. Nature, propriétés. Mode d'action. [Studies on anatoxins.]—*Rev. Immunol.* 8. 69-85. 2270

This treatise on anatoxins covers the work of R. and his collaborators since his development of diphtheria anatoxin in 1923, and forms part of a review of his work on immunology during the last quarter of a century.—W. M. HENDERSON.

FREUND, J., & BONANTO, M. V. (1946.) The duration of antibody-formation after injection of killed typhoid bacilli in water-in-oil emulsion.—*J. Immunol.* 52. 231-234. 2271

Following inoculation of living or killed typhoid bacilli incorporated in lanoline-like substances ("aquaphor" or "falba") agglutinins were found to be present in the serum of rabbits more than three years after the last inoculations had been performed.—S. J. G.

OWEN, R. D. (1945.) Immunogenetic consequences of vascular anastomoses between bovine twins.—*Science*. 102. 400-401. 2272

Tests for inherited erythrocyte antigens in blood samples from some eighty pairs of bovine twins demonstrated the presence of identical blood types in the majority of cases. This finding cannot be explained by monozygotic twinning or chance identity between fraternal twins and must be attributed to the interchange of ancestral blood cells through vascular anastomoses.

—E. F. MCCARTHY.

I. NEGRONI, P. (1944.) Acción del factor de difusión (factor R) sobre la reacción cutánea a la tuberculina. [Effect of the Reynals diffusion factor on the cutaneous reaction to tuberculin.]—*Rev. Inst. bact., B. Aires*. 12. 247-257. [English & French summaries.] 2273

See also absts. 2205 (staphylococcal anatoxin), 2207 (streptococcal M antigen), 2208 (immune sera), 2214 (TB. immunity), 2227, 2228, 2231 (brucella immunization), 2233 (brucella diagnosis in horses), 2263 (complement-fixing antigen for virus diseases), 2284 (trichina antiserum), 2345 (antigenic property of glycerin).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

BOUVIER, G. (1945.) Notes de parasitologie. [Parasitological notes.]—*Schweiz. Arch. Tierheilk.* 87. 505-511. [In French.] 2275

This article consists of four short notes on entomological subjects, two of which are of direct interest to the veterinarian. The first of these describes an outbreak of sarcoptic mange in the bovine, a condition which is rare in Switzerland. A bull was noted to be affected with a skin disease, thought to be dry eczema, when it was brought down from the alpine pastures in autumn, but it was not until April of the next year that the owner sought advice and mange was diagnosed. At this time the animal was emaciated and had generalized alopecia and great thickening of the skin of the limbs and tail. A number of cows were noted to be licking and scratching and a month later 50 beasts were involved in the outbreak, the principal lesions being at the base of the tail and at the point of the buttock.

A description is given of the mites recovered from these cases. Although horses were groomed with the same tools as the cattle they did not show symptoms of the disease, but the farmer and three cowmen were affected, lesions being found on the skin of the arms, armpits, shoulders and back. Treatment of the human cases was carried out with a proprietary derris preparation (Actox Sandoz) and also with D.D.T. Repeated applications of the derris wash were required in the most persistent cases: the cattle were treated with the same derris preparation. Some of the cattle were cured by a single treatment but others required two. The bull was not completely cured, in spite of numerous dressings; although its condition greatly improved it was finally sent for slaughter.

The second interesting note describes a severe louse infestation in a herd of cattle, 40 cows and heifers

II. NEGRONI, P. (1944.) Acción del ácido ascórbico oxidado sobre la reacción cutánea a la tuberculina. [Effect of oxidized ascorbic acid on the cutaneous reaction to tuberculin.]—*Ibid.* 258-261. [English & French summaries.] 2274

I. The Duran-Reynals "spreading factor" isolated from rat testicle and inoculated into the cutis of tuberculous g. pigs inhibits or reduces the reaction to crude or P.P.D. tuberculin, injected along with it.

If the "spreading factor" is injected 1-2 hours after the tuberculin, there is little or no modification in the reaction, but if it is inoculated 3-8 hours later, the reaction is intensified and reaches its peak earlier. Purified "spreading factor" from bovine testicle gives the same results.

It seems then that mucinase inoculated into a tissue modified by slight inflammation, increases cell permeability and accelerates the intradermal allergic reaction. This lends support to the view that, in the first stage at least, allergic skin reactions are the result of union of antigen and antibody within sensitized cells.

II. Oxidized ascorbic acid mixed in different dilutions with P.P.D. tuberculin modifies the course and the intensity of the intradermal allergic reaction in tuberculous g. pigs, reactions taking place more quickly and reaching their peak earlier. It seems that under certain conditions, oxidized ascorbic acid increases cell permeability; results tend to show that the intradermal reaction takes place within sensitized cells.

The results resemble those obtained with "spreading factor."—I. W. JENNINGS.

being involved. Large numbers of *Bovicola* (*Trichodectes*) *bovis*, *Haematopinus eurystrernus* and *H. tuberculatus* were found on all the cattle, but *Linognathus* (*Haematopinus*) *vituli* was found in small numbers only on a single animal. The animals were treated with a derris wash (3% Actox Sandoz), and when examined 20 days later the general condition of the animals had improved and they were free from lice.—T. E. GIBSON.

*WEYER, F., & ZUMPT, F. (1942.) Gesundheitsschädliche Insekten und Spinnentiere der warmen Länder. Erkennung, Bedeutung, Bekämpfung. [Insects and Arachnida injurious to health in the tropics.] pp. 104. Hamburg: Tropenverlag Fr. W. Thaden. RM. 3.80. [Abst. from review in *Dtsch. tierärztl. Wschr.* 50. 474.] 2276

This book is intended for farmers and other Europeans living in the tropics, particularly in Africa, but is said to be of value for its information about the injurious species of insects in other warm climates, and even Europe. In the general section, the structure, specific characteristics and the habits of the various groups are dealt with, a table being given for the differentiation of the principal injurious arthropods; by consulting this table and considering their locality and habits, even a layman should be able to find the family of any given specimen. In the special section the most important of the injurious arthropods are described with regard to their appearance, occurrence, habits, importance and control.

Groups dealt with are the mosquitoes, gnats, sandflies, tsetse flies, gad flies, house and biting flies, fleas, bugs, cockroaches, ticks, parasitic larvae occurring in the body, and mange mites. A further chapter deals with injuries from stings and bites and their treatment.

—U. F. RICHARDSON.

MACKERRAS, I. M., & MACKERRAS, M. J. (1944.) Sheep blowfly investigations. The attractiveness of sheep for *Lucilia cuprina*.—*Bull. Coun. sci. industr. Res. Aust.* No. 181. pp. 44. 2277

This bulletin is mainly restricted to consideration of the factors that cause *L. cuprina* to visit sheep and to lay eggs on them. These have been studied under natural field conditions and in the insectary with naturally, attractive sheep and with sheep made artificially attractive.

In the field susceptible unstruck sheep and to a very much greater degree struck sheep, are specifically attractive to gravid *L. cuprina* females. Free moisture in the fleece plays an important part in the development of attractiveness. Sheep with dry fleeces whether clean or stained are not attractive.

In the insectary all the species tested, viz., *L. cuprina*, *L. sericata*, *Calliphora stygia*, *C. augur* and *Chrysomya rufifacies*, are more or less attracted to and feed on soiled or wet fleece. *L. cuprina* oviposits more readily than other species. All species at times oviposit on sheep and their maggots are capable of developing on them. Oviposition by *L. cuprina* sometimes stimulates *L. sericata* and *Ch. rufifacies* to oviposit in the same area.

The greater virulence of *L. cuprina* in the field is due to failure of other species to oviposit and not to their maggots being unable to establish themselves. It may also be due to the weaker response of *L. cuprina* to phototropic stimuli.

Sheep were made artificially attractive by placing plugs soaked in various chemicals in the wool as suggested by HOBSON. Plugs soaked in alcoholic indole solution proved to be an excellent attractant. The attractiveness of indole was not greatly affected by variations in pH. It was enhanced by the addition of ammonium carbonate and decreased by acetic acid. A similar degree of attractiveness was not obtained when plugs were exposed in wool *in vitro* so that the living sheep must play some part. Wide variations were noted also in the degree of attractiveness of individual sheep carrying the same attractant, and the degree of attractiveness of individual sheep varied from time to time. Young sheep were generally more attractive than old sheep. Factors such as fleece length, fibre diameter and condition did not influence attractiveness. The presence of old "fleece rot" lesions enhanced attractiveness. Rugging of sheep rendered them less attractive than unrugged sheep. Plugs wet with indole and tied in the fleece were more attractive than fleece wet directly with indole or indole plugs isolated from contact with the fleece.

Using indole plugs as an attractant, the repellent properties of six essential oils and of Stockholm tar and iodoform were tested. Oil of citronella was the best repellent. The constituents of citronella oil which gave the best repellence were borneol, camphene and geranyl acetate.

Temperature seemed to be the only climatic condition affecting egg laying. Oviposition took place when the maximum daily temperature was as low as 63°F. Optimum conditions were a maximum of 70°F. or higher and a minimum of over 60°F. Maximum oviposition usually took place in the morning with rising temperatures. If midday temperature was excessive, flies became inactive until the temperature dropped in the afternoon.

Observations on samples of the fly population in the insectary showed that the proportion of gravid females was often as low as 2% and rose as high as 25% with a norm of about 5%.

Absence of protein food for the flies resulted in a

decrease in oviposition. This decrease could be eliminated by the provision of a protein meal.

The proportion struck of susceptible areas of the fleece was proportional to the density of the fly population. With small populations only some of the most attractive areas would be struck.

The distance over which *Lucilia* perceives an attractive area is small so that there is a definite element of chance in sheep being struck and a very high population of flies is necessary before all susceptible sheep are struck.—N. P. H. GRAHAM.

BELSCHNER, H. G. (1945.) The southward spread of the buffalo fly (*Lyperosia exigua*) and control methods adopted in Queensland.—*Aust. vet. j.* 21. 56-60. 2278

The buffalo fly is believed to have been introduced into Australia in the vicinity of Darwin in 1825. During the next 100 years it spread slowly as far as Broome in Western Australia and to the Queensland border. Further spread was prevented for 20 years by sparsely populated, arid belts of country. Wet seasons in 1939-41 enabled the fly to cross this barrier and reach the east coast of Queensland in the vicinity of Cairns. During the next four years the fly spread rapidly down the coast and is now entering the main coastal dairy area south of Rockhampton.

Infested cattle show large raw areas due to rubbing. Bulls and stags [bullocks] are more susceptible than cows, and adult cattle more than calves. Opinions vary on the economic loss caused by the fly.

In attempts to control the spread of flies through rail transport of cattle, the cattle are sprayed while in the trucks with a tar oil and resin emulsion; this drives the flies off the cattle and the train is moved off before they settle back. Decoy pens of cattle are kept near the spray to attract the dislodged flies.—N. P. H. GRAHAM

LEGG, J. (1945.) Buffalo fly. Fly movements and measures of control.—*Aust. vet. j.* 21. 60-64. 2279

It is thought that *Lyperosia exigua* will have little difficulty in establishing itself along the seaboard of the east coast of Australia.

Two methods of control have been tried on properties, the American horn fly trap and spraying the affected animals with D.D.T. The American horn fly trap has been modified by replacing the gauze trapping boxes with windows of glass or reinforced cellophane which have been sprayed with 4% D.D.T. in kerosene. The use of these windows simplifies construction of the trap. About 90% of the flies on cattle passing through the trap are caught. The trap is only suitable for use on dairy farms or small properties. Spraying cattle with 4% D.D.T. in kerosene will give freedom from flies for 2-3 weeks and it may take another 2-3 weeks for the fly population to build up to pre-spraying levels. It is only necessary to treat small areas on each beast, and treating half the herd or the most susceptible animals in a herd gives almost as good control as treating the whole herd. Owing to the tendency of kerosene to scald the skin other vehicles are being tried.

—N. P. H. GRAHAM.

HEIDEMANN, J. (1943.) Über äusseren Bau, Bestimmung und Lebensweise der veterinärmedizinisch wichtigen Zecken. [The morphology and life-histories of ticks of importance in veterinary medicine].—*Dtsch. tierärztl. Wschr.* 51. 39-40 & 78-80. 2280

H. gives a short general account of the ticks of domestic animals, with brief descriptions of their structure and the characters used for their identification. The developmental cycle is described and notes are given on the approximate time required for the cycle. It is pointed out that ticks have a preference for certain

ests and that if they are forced to feed on other animals the rate of increase is reduced.

Although strains of *Boophilus* infected with *Babesia bigemina* retain their infection when fed on animals other than cattle, the virulence of the organism for cattle comes greatly reduced. It is pointed out that whilst stures can be cleaned of East Coast fever by removing tle from them for a period, pastures infected with *bigemina* cannot be cleaned in the same way, if there e still small animals on which the ticks can feed. any babesial infections are transmitted only by adult ks of the next generation, as the larvae and nymphs ed on small wild animals. A brief account is given methods of tick destruction.—U. F. RICHARDSON.

IMPT, F. (1944.) *Rhipicephalus sanguineus* Latreille und andere krankheitsübertragende *Rhipicephalus*-Arten. [*Rhipicephalus sanguineus* and other disease-transmitting species of *Rhipicephalus*.]—*Dtsch. tropen-med. Z.* 48. 117-128. 2281

There are about 40 species of the genus *Rhipicephalus*, almost all of which occur in Africa. Only two species do not occur south of the Sahara, *R. bursa* of the Mediterranean area and the Caucasus, and *R. emaphysaloides* of India and South China. *R. sanguineus* is a cosmopolitan species occurring in all warm climates, which probably originated in Africa and spread to other areas by the movement of dogs. *R. sanguineus* described and the characters differentiating it from other important species are given. *R. appendiculatus* resembles *R. sanguineus* in scutal punctation but the ale has a process on the front coxae. *R. simus* has very fine, widely diffused scutal punctations, between which are larger ones arranged in four irregular rows. The anal plates are more or less sickle-shaped. *R. pensis* has very coarse, extremely crowded scutal punctations. *R. evertsi* has coarse punctations but they are less crowded than in *R. capensis*. In *R. pulchellus* the male is 4.4-5 mm. long, as against 2-4 mm. long *R. sanguineus*.

An account is given of the life-cycle of *R. sanguineus*. Experimentally it has been found that the larvae of this species can survive unfed for 250 days, the nymphs up to 98 days and the adults up to 570 days. In subtropical districts it is reckoned that one generation is produced yearly. The other species resemble *R. sanguineus* in their development except that *R. bursa* and *R. evertsi* require only two hosts, the larvae moulting to nymphs at the first host.

R. pulchellus and *R. sanguineus* readily attack man and cause intermittent skin irritation in the anal and scutal region. Their saliva entering the blood causes

also abts. 2241 (setse flies), 2246 (vectors of canine babesiosis), 2248 (of *Leucocytozoon* in turkeys), 2414 (*Dermacentor albipictus*), 2247 (constitutional repellency to ticks), 2374, 2375 (insecticides), 2422 (parasites of domestic animals in North America).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

UTER, F. (1944.) Einiges über *Cysticercus inermis* bei französischen Rindern. [*Cysticercus bovis* in French cattle.]—*Z. Fleisch- u. Milchhyg.* 54. 158-159. 2283

During abattoir inspection of the carcasses of 40,467 French cattle, 201 (0.5%) were found to be infested with cysticerci. Cysts were found in the masseter muscles in 193 cases, in the oesophagus in 22 cases, the tongue in five cases and in the heart in five cases.

In addition to examination of the masseter muscles, recommends regular and careful inspection of the oesophageal wall where the cysts appear more frequently and are easier to demonstrate than in the tongue or the heart.—H. E. HARBOUR.

destruction of erythrocytes, restlessness and emaciation. *R. simus* has been recorded as causing tick paralysis; the inoculation of eggs of *R. sanguineus* into experimental animals also causes paralysis.

A brief account is given of the babesial and theilerial diseases of animals transmitted by members of the genus, and also of their transmission of rickettsiasis, tularaemia, Nairobi sheep disease and anaplasmosis. *R. sanguineus*, in addition to transmitting *fièvre boutonneuse* from dog to man, can also act as an occasional transmitter of relapsing fever and Rocky Mountain spotted fever, whilst *R. appendiculatus* transmits tick-bite fever of South Africa.

It is thus shown that house dogs should be kept free from ticks, lest houses become infested and human disease result. Dogs should be washed with 3% creolin, or washed with carbolic soap and spirits of camphor rubbed into the coat. A mixture of derris powder and talcum (3:1) is also recommended.

For infested houses the use of gases is recommended, *vis.*, "Zyklon B", "T-gas", "Tritox" or sulphur dioxide. A blow lamp may be required for ticks in crevices of plaster. Lysol or cresol is suitable for washing kennels. For the control of cattle ticks dipping is recommended.—U. F. RICHARDSON.

WAGNER, O. (1943.) Das Schadaufreten der südeuropäisch-westsibirischen Zecke *Dermacentor marginatus* bei Schafen im Hessischen Ried. [Damage caused to sheep in the Hessian fens by *Dermacentor marginatus*.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 51/49. 80 & 118-120. 2282

Although not an indigenous tick of Germany, *D. marginatus* has established endemic colonies in the Hessian fens and in the Main valley, Lower Franconia. In other areas this tick is known to transmit equine and canine piroplasmiasis and related species are known to transmit rickettsial infections and to cause tick paralysis.

In the Hessian fens the adult ticks attack sheep at the end of the winter, attaching themselves at the back of the head, round the base of the ears and on the anterior part of the back. They cause a severe loss of wool, and if the sheep have been weakened by other causes, such as a severe winter or helminth infestations, a heavy mortality results. After the cold winter of 1941-42 a mortality of nearly 50% of sheep in this area was recorded.

Owing to the presence of wild animal reservoir hosts, it is not thought possible to starve out the ticks, but it is recommended that infested areas should not be grazed by sheep from August to May.—U. F. R.

DORIN, R. P. (1946.) The preparation and demonstration of an antiserum for *Trichinella spiralis*.—*J. Parasit.* 32. 83-86. 2284

Antigenic substances from the larvae of *T. spiralis* were adsorbed on to aluminium hydroxide cream which was subsequently injected into rabbits. A high degree of resistance to infection developed in the rabbits and they produced a high-titre antiserum which conferred a passive resistance to infection on rats.—J. F. A. S.

REID, W. M. (1945.) Comparison between *in vitro* and *in vivo* glycogen utilization in the fowl nematode *Ascaridia galli*.—*J. Parasit.* 31. 406-410. 2285

The utilization of glycogen by parasitic worms had

been estimated previously by *in vitro* methods. R., working with *Ascaridia galli*, compared the *in vitro* utilization of glycogen with that occurring *in vivo* when the host is starved for the same period. He found that these parasites utilized about equal amounts of stored

glycogen whether they were starved *in vivo* for 48 hours or kept in 1% saline for the same period. The males consumed slightly more than the females. He concludes that *in vitro* tests are reliable indicators of the *in vivo* utilization of glycogen.—J. F. A. SPRENT.

See also absts. 2376, 2379 (anthelmintics), 2422 (parasites of domestic animals in North America).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

OTTOSEN, H. E. (1943.) Scirrhus Adenokarcinomer i Uterus hos Køer. [Scirrhus adenocarcinoma in the uterus of a cow].—*Skand. VetTidskr.* 33. 473-482. [English summary slightly amended.] 2286

O. describes 14 cases of scirrhus adenocarcinoma in the uterus of cow. In eight of these cases, metastasis was discovered in the lungs.

According to O., apparently primary scirrhus adenocarcinoma in the lungs of cattle is fairly common; it may, however, originate from a primary tumour in the uterus.

FURTH, J. (1946.) Recent experimental studies on leukemia.—*Physiol. Rev.* 26. 47-76. 2287

This review includes references to some of F.'s own as yet unpublished studies on experimental leukaemia. The basic change in leukaemia is the conversion of normal haemopoietic cells, under the influence of various extrinsic and genetic factors, into abnormal immature blood cells with greatly increased growth abilities. The leukaemic cells possess characters which enable them to be distinguished from normal cells, e.g., failure of complete differentiation and ability to overcome the barriers which restrain normal immature cells. Leukaemic cells may remain at the site of origin or they may be transported to other sites and multiply there. The basic change is intrinsic since it persists in tissue culture; it involves enzymatic and metabolic characters of the cell, but no one character serves to identify the neoplastic cell. The three main theories of causation of the basic change (somatic mutation, virus, autocatalytic growth factor) may possibly be integrated to form a more accurate and comprehensive theory than is afforded by any one of them.

F. has contributed much to the subject and this article should be consulted in the original. Most of the work referred to has been with mouse leukaemia, but leukaemia in fowls is also mentioned.—E. G. WHITE.

EGERHJ, J. (1945.) Systematiske blodundersøgelser i kvaegbesætninger med stationær lymfocytomatose. [Systematic blood examination in cattle herds with lymphomatosis].—*Maanedsskr. Dyrlæger.* 57. 124-130. 2288

Blood examinations were made at half-yearly intervals in a group of herds of cattle in which cases of lymphomatosis had occurred. A total of 596 cattle were involved, of which 116 were examined more than once.

57 cattle aged 2 years in a healthy herd served as controls. In this group the number of leucocytes per ml. of blood varied from 7,000 to 12,000; lymphocytes comprised 50-59% of the white cell count; mononuclear cells never exceeded 85% of the white cell count.

In the cattle from the infected herds the number of white cells per ml. varied from 8,000 to over 15,000. Of those cattle which had more than 12,000 white cells per ml., 19.9% later developed clinical lymphomatosis. The lymphocytes exceeded 60% of the white cells in 17.3% of the cattle and 5% of cattle with such counts later developed clinical lymphomatosis. Immature mononuclears were found in the blood of 75.2% of the

cattle in the infected herds, the numbers ranging from less than 4% to over 20% of the white cell count. Of those cattle which had over 10% of immature mononuclears in the purified blood, six out of seven later developed clinical lymphomatosis.—M. EKENBERG.

I. FRANKE, F. E., & RICHERT, D. (1944.) Effects of sublethal doses of a polysaccharide from *Serratia marcescens* (*Bacillus prodigiosus*) on the electrocardiogram, blood ascorbic acid, and non-protein nitrogen of the dog.—*J. nat. Cancer Inst.* 5. 179-183. 2289

II. FRANKE, F. E. (1944.) Action of toxic doses of the polysaccharide from *Serratia marcescens* (*Bacillus prodigiosus*) on the dog and guinea pig.—*Ibid.* 185-193. 2290

III. BRUES, A. M., & SHEAR, M. J. (1944.) Chemical treatment of tumors. X. Reactions of four patients with advanced malignant tumors to injection of a polysaccharide from *Serratia marcescens* culture filtrate.—*Ibid.* 195-208. 2291

I. Injection of the polysaccharide (which induces haemorrhagic changes in grafted tumours in rats and mice) in sublethal doses into dogs had only a slight effect on the electrocardiograms. The injections had variable effects on the blood ascorbic acid, caused no change in serum calcium, but usually produced an increase in blood non-protein nitrogen.

II. Intravenous injection of the polysaccharide into anaesthetized dogs in doses of 0.3-4.3 mg. per kg. body weight caused death from circulatory failure in a few hours. Injections of adrenalin did not modify the toxic action. The injection of the polysaccharide into unanaesthetized dogs caused convulsions and death 12-24 hours later. Examinations P.M. revealed congestion and haemorrhage of the liver, intestine and lymph nodes. An increase in capillary permeability occurred in the tissue at the site of injection of the polysaccharide.

III. Four patients (with prostatic carcinoma, lymphosarcoma, multiple myeloma and Ewing's sarcoma) were given intramuscular injections of the polysaccharide, but all died of cancer. Two of the patients had temporary relief of symptoms but the case of multiple myeloma was not affected by the treatment. The cases which responded appeared to suffer from the effects of the breakdown products of the destroyed tumour tissue.—E. BOYLAND.

BURMESTER, B. R., PRICKETT, C. O., & BELDING, T. C. (1946.) A filtrable agent producing lymphoid tumours and osteopetrosis in chickens.—*Cancer Res.* 6. 189-196. [Authors' summary copied verbatim.] 2292

1. Manifestations of the filtrable agent or agents of a transplantable lymphoid tumour of the chicken were demonstrated in 3 experiments involving 150 birds.

2. Inocula containing viable tumour cells induced tumour growth at the site of inoculation, metastasis to the viscera, and death of all birds in a relatively short time (average 10-2 days); whereas centrifuged extracts of the same tumours, or filtered plasma of birds bearing tumours, when injected intramuscularly, intraperitoneally, or intravenously into 2 to 3 day old chicks,

duced in 6 months a high incidence of osteopetrosis and lymphomatous tumours of the viscera (average of 1 per cent on gross examination) but no tumours at the site of inoculation.

3. These results suggest that the avian lymphoid tumour strain under study, which has been transferred serially in over 200 passages by transplantation of its cells, carries with it a filtrable agent or agents capable of inducing osteopetrosis and lymphomatous tumours of the viscera after an incubation period of at least months.

PENTIMALLI, F. (1941.) Transplantable lymphosarcoma of the chicken.—*Cancer Res.* 1. 69-70. 2293
[Only abstr. given.]

P. considers that the tumour described, occurring originally in an emaciated Leghorn hen, is the first example of a transplantable fowl lymphosarcoma. The tumour was passaged in fowls 23 times in a year. Details of the tumours in inoculated fowls are given. In the few tests carried out the tumour material was not infective by intravenous inoculation; the infective agent did not pass the Berkefeld V or N filter.—J. D. B.

BURMESTER, B. R., & PRICKETT, C. O. (1945.) The development of highly malignant tumor strains from naturally occurring avian lymphomatosis.—*Cancer Res.* 5. 652-660. [Authors' summary slightly amended.] 2294

Young chicks injected intraperitoneally with affected organs of chickens with visceral lymphomatosis developed lymphomatous tumours of the viscera in a relatively short time.

Inocula prepared from different donors varied greatly in their activity. The material showing the greatest potency induced tumours in 13 of the 17 birds inoculated and caused death in an average of eleven days after inoculation. Tissues that became involved included abdominal wall, adrenal, gonad, heart, kidney,

see also absts. 2380-2383 (chemotherapy of leucaemias and tumours).

liver, mesentery, intestine, pancreas, peritoneum, proventriculus, and spleen. The least potent material, though grossly similar to the most potent, produced no tumours in 37 chicks injected during the experimental period of 86 days. No essential differences in the gross pathology between the strains were noted.

The neoplastic cells, implanted in young chicks, induced lymphoid tumours that were both macroscopically and microscopically similar to the tumours providing the original inoculum.

The question of transmission by a filtrable agent has not yet been investigated.

BREWER, N. R., & BROWNSTEIN, B. (1946.) The transmission of lymphomatosis in the fowl.—*Amer. J. vet. Res.* 7. 123-128. 2295

Experiments on a transmissible strain of lymphoid tumour, apparently similar to those previously described by OLSEN [*J. B.* 14. 16], PENTIMALLI, and BURMESTER & PRICKETT [see absts. preceding] are recorded.

Lymphomatous tissue from the liver and spleen of a 407-day-old fowl was inoculated intraperitoneally into day-old chicks and a tumour strain was established.

Of 2,197 inoculated chicks, 1,275 (58%) died with gross evidence of lymphomatosis before they were 100 days of age. None of the contact and control chicks died of lymphomatosis during this period. Serial passage served to enhance the virulence of this tumour strain as evidenced by more rapid development and a higher incidence of lymphomatosis in inoculated chickens.

The incidence of lymphomatosis in chicks placed in contact with inoculated chicks was significantly higher than in non-contact controls. Lymphomatous tissue was fed and at the same time instilled into the eye and nasal cavity of 1,568 chicks: of these, 60% died of lymphomatosis before they were 100 days old. Only 0.3% of a control group of 761 sibs died of lymphomatosis before they were 100 days old.—F. D. ASPLIN.

DISEASES, GENERAL

LOVELL, R. (1945.) Calf diseases.—*Vet. Rec.* 57. 499-500. Discussion pp. 500-501. 2296

L. states that in the north and north-western agricultural districts of England at least 6% of calves born alive die before they are six months old and that similar or heavier losses occur elsewhere. The chief causes of these deaths are white scours and infection with salmonella organisms, pneumonia of varying etiology, calf diphtheria and lead poisoning. White scours is probably the commonest disease of young calves. Its prevention is closely related to methods of husbandry and the feeding of colostrum. Calves which have been separated from their dams at birth may be given 2-3 pints of serum or double these amounts of blood taken from their mothers or from their cows. In some cases white scours has been controlled by giving shark-liver oil and nicotinic acid. Whole milk should be withheld and water followed by diluted milk given instead. *Salmonella dublin* infection occurs in older calves, producing blood-stained diarrhoea and septicaemia with pneumonia may develop. Pneumonia in calves is often associated with fatigue after transit. *Actinobacillus actinoides* may be a primary cause of many cases and *Corynebacterium pyogenes*, *Streptococcus* and haemolytic coccobacilli develop in lungs already damaged. Sulphapyridine and *Corynebact. pyogenes* antitoxin are the most popular therapeutic

agents in calf pneumonia. Lead poisoning is usually acute and calves are often found dead; paint is the usual source of the poison. Treatment of acute cases is unlikely to be of value, but magnesium sulphate and sodium citrate have been tried and in subacute cases, small doses of potassium iodide have been given.

—D. D. OGILVIE

SJOLTE, I. P. (1945.) Lidt om Sygdomstilstande hos Dyr fra zoologiske Haver. [Diseases of animals in zoological collections.]—*Maaanedsskr. Dyrjaeger.* 57. 149-159. 2297

This is a short description of P.M. examinations carried out on 615 animals over a period of 35 years, the animals coming from the Copenhagen Zoological gardens and from other smaller collections, circuses, etc. A full list is given, the most important classes numerically being monkeys (329), carnivores (113) and ungulates (115).

A proportion of deaths of wild animals in captivity is due to their failure to become acclimatized; in such cases P.M. findings are vague, e.g., a monkey which was imported in summer and died during the first winter showed only a slight catarrhal enteritis and dilatation of the heart.

The commonest causes of death in monkeys were TB. and ulcerative enteritis, evidently due to malnutri-

tion. The chief causes of death of carnivores were TB. and distemper. Other diseases were congenital goitre in wolves and various kinds of neoplasm in the Felidae. Parasitism was not important.

TB. was found in a tapir and in porcine species; in the Equidae strangles, colic and croupous pneumonia were the principal causes of death. Malignant catarrh or a disease like it was discovered in some "oxen" and "bloat" was seen in many of the ruminating animals. Diphtheritic pharyngolaryngitis and gastritis occurred in three deer. Seven cases of necrobacillosis of the mouth in kangaroos were seen and in ostriches there were TB., rupture of the oviduct and fibrinous inflammation of the air sac. Helminthiasis rarely caused death in any species.—J. E.

CHAPRON, F. (1942). Sur un cas d'éphidrose chez le cheval. [Hyperhidrosis in a horse.]—*Rec. Méd. vét.* 118, 157-159. 2298

A case of localized excessive sweating in a horse is described. The condition was confined to two patches, one on each side of the withers; these were sharply defined, the affected area on the right being much larger than that on the left. The temperature was normal, as were the pulse and respiration. Neither injury nor infection could be incriminated as the cause. The muscle reflexes on the left side were less marked than on the right. C. was of opinion that it was caused by reflex stimulation of the sympathetic system as a result of some irritation which he localized in the anterior portion of the digestive system.—M. C.

SUTTON, G. D. (1944). Cases of submucosal haematoma of the vagina in thoroughbred mares.—*J. S. Afr. vet. med. Ass.* 15, 75-76. 2299

In this paper S. describes a condition in thoroughbred mares soon after foaling which is characterized by swelling and collection of blood in and under the folds of the mucous membrane of the vagina. If the folds protrude, gangrene may occur. The condition was treated by operative measures in most of the cases, local anaesthesia being used. An incision was made in the healthy tissue round the edge of the haematoma, which was then cut across the base. The wound was sutured and although haemorrhage was troublesome, it stopped in about 15 min. All the mares operated upon foaled the next season, except one which died of horse-sickness.—E. M. ROBINSON.

PATTISON, I. H. (1946). Observations on a possible case of jaagziekte in a sheep in Palestine.—*J. comp. Path.* 56, 63-67. 2300

P. describes the microscopic changes in the lungs of a sheep with a subpleural, greyish nodule. The histological changes resembled very closely those associated with *jaagziekte*, i.e., the appearance of glandular tissue reminiscent of mammary gland resulting from an apparent proliferation of the epithelium in the alveolar regions. A cautious attitude is adopted as to the possibility that *jaagziekte* exists in Palestine, but P. considers that it may occur in a 'subclinical form.

—R. E. GLOVER.

CAMPBELL, R. L. (1945). Icteric condition found in hogs in Northern Missouri.—*N. Amer. Vet.* 26, 347-348. 2301

C. describes an icteric condition which occurred in N. Missouri in pigs aged two weeks to six months. Morbidity was low in the herd but there was a high mortality in affected animals. Little is known of the condition in the literature but it is referred to by veterinarians in the locality as anaplasmosis-like. Spirochaetosis has also been suggested as the cause.

Erysipelas and cholera can occur as complications and result in heavy losses. Symptoms include a slow floppy gait with oedematous swellings of abdomen and hams. There is acute anaemia with jaundice (Hb = 10% of normal—Tallqvist scale). At examination P.M. there were generalized icterus, serous effusions, pulmonary oedema and gross spleno- and hepatomegaly. Blood smears revealed a rapid destruction of erythrocytes, many of them with bluish-staining particles resembling anaplasmosis smear preparations. Sodium-cacodylate administered to sick pigs before the onset of jaundice resulted in uneventful recoveries on one farm.—ALEX. H. HOGG.

— (1945). Non-parasitic pruritus in dogs. Discussion by the Central Veterinary Society. [Speakers:—JOSHUA, J. O., ISZARD, P. E. R., & WORDEN, A. N.]—*Vet. Rec.* 57, 153-156 & 168-170. 2302

MISS JOSHUA opened the discussion by dealing with the aetiology of non-parasitic pruritus in dogs from the dietary and psychological angles. The various clinical types of the affection were classified and modes of treatment were suggested. MISS ISZARD followed with a paper on wet and dry eczema, both localized and generalized, with special reference to treatment, and the possible causes of the various types. WORDEN dealt more fully with the relationship between lack of fat and skin disease and between lack of members of the vitamin B₂ complex and skin disease. Hypersensitivity to food proteins and photosensitization were also mentioned.

These three papers were followed by a general discussion on the subject, touching on nomenclature, aetiology, diagnosis and treatment. HARE gave a detailed account of β -haemolytic streptococcal infection in the dog.—I. W. JENNINGS.

SCHLOTTHAUER, C. F. (1945). Gallstones in dogs. Report of two cases.—*N. Amer. Vet.* 26, 349-351. 2303

S. observed gall-stones in dogs on only four occasions: two were reported previously and the others are now described. Gall-stones were discovered at P.M. examination of a male cocker spaniel aged 13 years which had shown no symptoms during life that could be attributed to disease of the gall bladder; the gall-stones were greenish-black in colour and of the bile-pigment type: they were soft and irregular in shape varying greatly in size. Hypertrophy of the prostate gland and a lipoma in the right axilla were also found.

The second case described occurred in a male springer spaniel, seven years of age. This animal, according to the owner, had had 35 attacks of jaundice in five years. At examination P.M., eight greenish-black gall-stones of the bile-pigment type were found in the common bile duct, but none in the gall bladder. A further stone was found in the pelvis of an atrophic left kidney; it resembled those found in the bile duct, except that it was much harder. The appearance of the liver suggested an acute toxic hepatitis. This is the only case seen by S. in an animal in which obstruction of the extra-hepatic biliary tract by gall-stones produced the symptoms and morbid changes of biliary disease as described in man.—ALEX. H. HOGG.

FORBUS, W. D. (1945). The reactions of tissues following infection and their place in an environmental conception of the nature of disease.—*Bull. N.Y. Acad. Med.* 21, 145-162. 2304

F.'s conception of the nature of disease is that it is the abnormal outcome of a constantly changing relationship between the cell and its environment. The aetiology of an infectious disease should therefore

be concerned not with an infective agent, but with the relationship between the infective agent and the cell.

—W. M. HENDERSON.

LAMONT, A. A. (1945.) An investigation into an outbreak of acute nephritis.—*J. R. Army vet. Cps.* 17, 31-34. 2305

Four fatal cases of acute nephritis in dogs were investigated during one week. The symptoms noted included extreme listlessness, followed in a few days by a rise in temperature for 1-2 days, dropping to normal or sub-normal as toxæmia developed. Vomiting was characteristic of the disease and lasted from the first rise in temperature until death, gradually becoming more severe. The visible mucous membranes were paler than normal, salivation was increased and a urinous odour was noticeable in the breath, becoming stronger with the toxæmia. The pulse was usually full and strong until a certain degree of toxæmia was established, after which it became faster and very weak. Urine was plentiful at first but later there was sometimes suppression. The animals became weak in the hind quarters and collapsed with uræmic symptoms. Any interference in the animals' semi-comatose state induced convulsions similar to the terminal fits of distemper; convulsive closing of the jaws was characteristic.

All urine samples had large quantities of coagulable protein. Urea was estimated as 0.75-1.0 mg. per 100 ml.; normally it exceeds 1.5 mg. per 100 ml. The centrifuged deposit showed white and red corpuscles in all samples and several spermatozoa in samples from the male dogs. Several types of bacteria, coliform organisms, streptococci, staphylococci, etc., were found but were considered to be contaminants. Two samples coagulated without heating, the coagulum apparently consisting of mucin. No bile salts were found in the samples. Examination of blood from the four dogs affected showed 155, 215, 261 and 370 mg. of urea respectively per 100 ml. of blood as compared with 30-35 mg. per 100 ml. in the blood of healthy dogs living under the same conditions.

Haemolytic streptococci were isolated from throat swabs from the four cases investigated, as well as from those from some apparently healthy dogs.

P.M., the kidneys appeared to be the only organs seriously affected. They were enlarged and the veins in the capsule were very congested with small haemorrhages on the surface; on section, the cortex and medulla also showed extreme congestion. There were a few petechiae in the lungs and on the heart and fatty changes in the liver. The histological findings confirmed that the damaged condition of the kidneys had caused the symptoms noted.

[L.'s conclusion that the condition was caused by the haemolytic streptococci seems to be based on insufficient evidence.]—J. A. GRIFFITHS.

ROBB-SMITH, A. H. T. (1945.) The skin and the reticular tissue.—*Brit. med. Bull.* 3, 172-175. 2306

It is known that reticular tissue is involved in disorders of the blood and that in many cases lesions are first manifest in the skin. The author reviews the histology of the reticular tissue in the skin and outlines the nature of cutaneous lesions in disorders of the blood or blood-forming organs in man.—C. W. OTTAWAY.

PHILLIPS, P. H. (1945.) Research on relationship of dual abnormalities in the sow and litter.—*Iowa Vet.* 16, No. 6, 5-9. 2307

P. cites a number of ailments affecting pigs in which

the aetiological factors have proved to be as much nutritional as bacterial. Beneficial results have been obtained by the addition of adequate quantities of vitamins and minerals to the diet, together with the use of therapeutic agents. [This article is an appeal for greater co-operation between the veterinarian and the nutritional worker.]—C. W. OTTAWAY.

SCHOOP. (1943.) Ungleichmässige Behaarung bei Rindern. [Uneven hair growth in cattle.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 51/49, 124-125. 2308

Partial hair loss occurring in a week old calf and a yearling is described. Asymmetrical hair length in two young animals is also reported.—E. F. MCCARTHY.

GOMORI, G. (1945.) The histology of the normal and diseased pancreas.—*Bull. N.Y. Acad. Med.* 21, 99-109. 2309

G. reviews the histology of the insular system in the normal pancreas and discusses the acinus-islet relationship. Although no cells intermediate between an acinus and an islet cell have been demonstrated, there is no doubt that islets can be formed from ducts even during adult life. The demonstration of islet cell types varies with staining technique; reliable stains are mentioned and cell counts given.

Examination of specimens from artificially induced diabetes, particularly chemical (alloxan) diabetes, has suggested that beta cells are concerned with the regulation of carbohydrate metabolism and that they actually secrete insulin.—C. W. OTTAWAY.

VIRVIESCAS, F., & MORENO FERNANDEZ, R. (1944.) Informe de las labores llevadas a cabo en el Laboratorio de Investigación Patológica, Bogotá, Colombia durante el año de 1943. [A table of the work completed in the Laboratory of Pathological Investigation, Bogotá, Colombia, during 1943.]—*Rev. Med. vet., Bogotá.* 13, 68-78. 2310

This table shows that investigations were carried out on the following:—streptococcal and staphylococcal infections, mastitis, anthrax, John's disease, haemorrhagic septicaemia, salmonella infections, contagious abortion, braxy, spirillosis, ringworm, coccidiosis, anaplasmosis, piropilosis, rabies, equine meningo-encephalitis, swine fever, tick control, acaricidiosis, verminous bronchitis, ascaridiosis, and the identification of internal and external parasites.—U. F. RICHARDSON.

DE GROOT, T. (1943.) De gladde tong bij het rund. ["Smooth tongue", an hereditary defect in cattle.]—*Tijdschr. Diergeneesk.* 70, 1-8. [English, French & German Summaries.] [Abst. from English summaries.] 2311

The clinical symptoms are described and evidence is produced which indicates that the condition is hereditary and due to a recessive factor.

Heterozygotes are normal and can be detected only by test matings. Affected animals have a low iron content in the blood serum and the erythrocytes are smaller in diameter than normal.—M. C.

SADIQ, N. (1944.) Double spleen in a goat—a congenital abnormality.—*Indian vet. J.* 20, 255-257. 2312

In this case of double spleen in a goat, the two portions together were nearly equal in bulk to the normal organ and were disposed in a single peritoneal fold. A detailed description is given of each portion.

—J. B. POLDING.

See also absts. 2333 (lipase in tissues in pathological conditions), 2338 (infertility in Argentine race horses), 2404 (otitis externa), 2415 (disease control in Swaziland), 2417 (in Mauritius), 2419 (in Zanzibar), 2420 (in Basutoland), 2421 (in Nyasaland).

NUTRITIONAL AND METABOLIC DISORDERS

WAGNER, J. R., & ELVEHJEM, C. A. (1944.) A study of canine hysteria produced by feeding certain baked dog foods and wheat gluten flour.—*J. Nutrit.* 28. 431-441. 2313

After a short discussion of work already published on hysteria in dogs, the authors give a summary of symptoms exhibited during an attack of hysteria. The various theories and findings as to aetiology are summarized, with especial reference to nutritional disorders as a causal factor. Thus MELNICK & COWGILL observed hysteria in dogs fed on rations containing gliadin; ARNOLD & ELVEHJEM in young dogs, where lysine deficiency was suspected; PATTON thought it due to thiamine deficiency, MCGHEE, to a low blood magnesium level, etc. The frequency of the disease in animals given baked dog foods is noted.

Following the discovery by PARRY that hysteria could be rapidly produced by feeding commercially prepared wheat gluten to young dogs, the authors experimented on mongrel puppies, which were weaned and wormed and fed normally for a week before being given the experimental rations; when hysteria occurred they were again given ordinary rations until they became normal once more and fit for further experiments. At 6-8 months of age, susceptibility to hysteria was so reduced as to make them unsuitable for assay purposes. The rations used included several commercial baked dog foods, the hysteria produced by some of which could not be prevented by the addition of thiamine hydrochloride, casein, dried canned dog food or lysine hydrochloride. These hysteria-producing dog foods were found to contain large amounts of wheat products. The rest of the experiments were made with laboratory rations containing wheat gluten. These rations produced hysteria similar in character to that produced by baked dog foods: it could not be prevented by the addition to the ration of various factors such as casein and casein hydrolysate, crystalline pyridoxine, calcium pantothenate, *D*-lysine hydrochloride, etc.

The authors conclude that hysteria is dietary in origin and suggest that toxicity and not deficiency is the causal factor, since it has been repeatedly demonstrated that the condition can be produced by the addition of wheat gluten flour to an adequate ration but cannot be prevented by supplementation with various food factors. The nature of the toxic factor in wheat gluten is still in question: it is distinct from selenium, which is a toxic substance in certain grains. The chemical properties of the toxic material are now under investigation.—ALEX. H. HOGG.

BEVERIDGE, J. M. R., LUCAS, C. C., & O'GRADY, M. K. (1944.) The effect of the nature and level of protein and amino acid intake upon the accumulation of fat in the liver.—*J. biol. Chem.* 154. 9-19. 2314

Rats fed on a diet containing gelatin as the chief source of protein developed fatty livers but the fatty change was prevented by feeding casein. The accumulation of fat in the liver is prevented by methionine, but the effect of the methionine depends upon the other amino acids in the diet. Methionine appears to be equally effective in the form of casein or as the pure free amino acid, if the essential amino acids are provided.—E. BOYLAND.

RANDOIN, L. (1944.) Quels sont ceux des oligo-éléments suivants: fer, manganèse, iode, aluminium, dont la suppression, dans des régimes artificiels renfermant des vitamines B, produit les mêmes effets polynéuritique que la suppression simultanée de ces oligo-éléments. [Polyneuritis produced in rats by

diets deficient in iron, manganese, iodine or aluminium.]—*C. R. Soc. Biol. Paris.* 138. 732-734. 2315

Iron, manganese, iodine and aluminium were shown to be necessary for the normal growth and health of the rat. When any one of these elements was lacking in a diet rich in carbohydrates and supplemented with sufficient B vitamins, the growth of rats declined within 2-3 months, with subsequent death of the animals. Both iron and aluminium deficiency produced polynéuritic symptoms resembling those in vitamin B deficiency.—E. KODICEK.

STEWART, J., FARMER, V. C., & MITCHELL, R. L. (1946.) Molybdenum and copper metabolism of farm animals. [Correspondence.]—*Nature, Lond.* 157. 442. 2316

Pasture samples from areas in Ross-shire, Perthshire, and Midlothian where swayback had occurred during 1943 in Scotland, had copper contents ranging from 4.4 to 9.2 p.p.m. and molybdenum contents from 0.34 to 1.20 p.p.m. These Cu values are marginal (less than 5 p.p.m.) to normal as defined by BENNETTS & BECK [see *V. B.* 16. 358] and the Mo values are all within the normal range. It is pointed out that it is therefore unlikely that swayback in lambs in Great Britain is due to an excess of Mo in the pastures which according to DICK & BULL [see *V. B.* 16. 359] "may explain the seeming anomaly of a Cu deficiency in sheep"—R. ALLCROFT.

LORD, J. W. (1945.) Seasonal variation of carotene and vitamin A in butter-fat and in serum.—*Biochem. J.* 39. 372-374. 2317

The vitamin A activity of butter-fat showed a seasonal variation which was related to the consumption of pasture, the average value when the cows were at grass being 31 I.U. per g. of fat as compared with 15 I.U. when they were stall-fed. The seasonal variation of carotene was more marked than that of vitamin A. Carotene contributed 20-28% of the total vitamin A activity during most of the year, but this amount rose to about 34% during May and June. Serum carotene and vitamin A values during pasture feeding were respectively 1.35 mg. and 150 I.U. per 100 ml. The corresponding values during stall feeding were 0.23 mg. and 31 I.U. per 100 ml. Comparatively high levels of carotene and vitamin A were maintained in both butter-fat and serum, even in November to December when the cows had access to pasture for only a few hours daily.—E. M. CRICKSHANK.

UNDERWOOD, E. J., & CONOCHIE, J. (1941-43.) Vitamin A in the nutrition of sheep in Western Australia.

1. The seasonal liver reserves. 2. The carotene content of pasture species.—*Aust. vet. J.* 17. 202-211, and 19. 37-42. 2318

1. The authors describe a two-year investigation of the seasonal reserves of vitamin A in the livers of wethers and non-pregnant ewes at two places representative of the central districts of the agricultural areas of Western Australia. There was great individual variation and a marked seasonal range. During the green feed period of the year and for the first half of the summer, the reserves remained high, but after 5-6 months grazing on dry mature pastures and cereal stubbles, there was considerable depletion of these reserves. A rapid increase followed the advent of green feed in the succeeding autumn. In the summer of 1939-40, which lasted for practically eight months, the liver reserves fell to below 100 I.U. per g. and in a number of cases to below 50 I.U. per g. In the dry summer period of the following year, which lasted only

5-6 months at one place the reserves rarely fell below 200 I.U. per g. of liver and at the other they remained in general as high as 300 I.U. per g. In discussing the practical significance of these results, the authors suggest that normally the vitamin A reserves are sufficient for wethers and non-pregnant ewes during the period of low intake in the summer months although they may be insufficient to satisfy the requirements of breeding ewes, particularly young ewes.

2. The carotene content was determined of representative pasture species taken from three centres in the southern agricultural areas of Western Australia at fortnightly intervals from July to November, 1941. The three centres selected were typical of the short season, drier areas, of the longer season, central areas, and of the wetter coastal districts. With all the annual species the carotene content fell from very high values (20-60 mg. per 100 g. dry matter) throughout the growing period to very low values (0.2-2.5 mg. per 100 g.) as the plants matured and dried off in early summer. The only perennial tested, a succulent shrub *Kochia brevifolia*, maintained a level of 10-16 mg. per 100 g. dry matter throughout this period. Species differences in the annuals studied were completely outweighed by the dominant influence on the carotene content of the climate and stage of maturity, although the legume sampled at each centre tended to carry a rather higher carotene content and to maintain this superiority for a slightly longer period than the grasses and other species. At complete maturity, however, the legumes were just as low as the other annuals. The authors discuss the significance of these findings with respect to the carotene requirements of grazing sheep and their vitamin A reserves.—M. C. FRANKLIN.

UNDERWOOD, E. J., & CURNOW, D. H. (1944.) Vitamin A in the nutrition of sheep in Western Australia. III. The carotene content of fodders and grains. IV. The vitamin A content of ewe's milk and colostrum. —*Aust. vet. J.* 20, 248-253 & 282-286. [For parts I and II, see preceding abst.] 2319

III. The carotene content was determined of a series of Western Australian fodders and grains, including oats, wheat and clover or "meadow" hays, oats and clover silages and wheat, and barley and oats grain. The results are expressed for crude and "true" carotene. The "true" carotene figures were obtained after removal with diacetone alcohol of non-carotene pigments included as "carotene" in most previously published analyses and are believed to give a much more accurate assessment of vitamin A potency than the "crude".

The mean "true" carotene content of wheat was found to be 0.8, of oats 0.9, and of barley 1.1 p.p.m. on the dry basis. For wheaten hay the mean value was 2.8 (range 0.5-8.8), for oats hay 5.6 (1.1-13.3), for clover or "meadow" hay 14.3 (2.4-33), for oats silage 46 (11-77) and for clover silage 144 (124-165) p.p.m. on the dry basis. The wheaten and oats hays classified on the ordinary commercial basis as of poor to medium quality averaged 1.8 and 2.3 p.p.m. of "true" carotene respectively. The corresponding figures for these hays classed as good to prime quality on the same basis were 3.4 and 7.4 p.p.m.

The results are compared with figures from other countries and their significance with respect to the capacity of the different feeds to supply the vitamin A requirements of stock is discussed.

IV. The vitamin A and carotene content of the colostrum and early milk of a small series of ewes was determined over two seasons. In the first season (1943) young, green grazing was available to the ewes for at least two months prior to lambing. The total vitamin

A potency of the colostrum of six Border Leicester × Merino ewes in this season averaged 1,287 I.U. per 100 ml. The average levels fell within 48 hours to 120, within four days to 83, within six days to 39 and within nine days to 26 I.U. per 100 ml. Carotene contributed little to the total vitamin A potency of colostrum and accounted for only a small proportion of the total potency in the milk taken 48 hours and four days after lambing.

In the following season (1944), the ewes subsisted on carotene-deficient pasture throughout pregnancy and for about two months previously. The vitamin A content of the colostrum in this season was more variable—one-quarter to one-third of the values of the previous year. The levels at 48 hours averaged less than one half of the 1943 levels. At nine days samples of milk from five Merinos contained only a trace of vitamin A but samples from seven Border Leicester × Merino crossbreds were very little lower than in the previous year.

The possible significance of these results in relation to the health and early growth of the lamb is discussed and the suggestion is made that vitamin A deficiency is rarely likely to be a limiting factor with breeding ewes in the southern agricultural areas of Australia.—R. L. R.

TEMPERTON, H., DUDLEY, F. J., & THORN, M. B. (1945.) The use made by the chick of dietary sources of carotene and vitamin A during the first month of life.—*Harper Adams Util. Poul. J.* 30, 57-84. 2320

A large-scale field experiment was planned to determine whether the amount of vitamin A and carotene in the diet of the hen affects the vitamin A reserves of the newly hatched chick, whether the chick can utilize vitamin A and carotene from the food in the first four weeks of life or whether it depends on reserves present at the time of hatching, and whether there is any difference in the effect on the growing chick of vitamin A as such, and of carotene.

The breeding stock used for the tests comprised 120 Rhode Island Red and Light Sussex pullets and eight Rhode Island Red cockerels. They were divided into four comparable groups and given a basal ration (in parts by weight) of whole oats 40, wheat bran 15, wheat middlings 21, ground oats 17, dried yeast 3 and fish meal 4. One group had no supplement, one had β-carotene, one had vitamin A from shark liver oil, and one had half vitamin A and half β-carotene. The control group had an oily solution of vitamin D₃ and the vitamin A and β-carotene doses were made up with vitamin D₃ for the other groups.

The experiment was carried on for seven months and as egg production was poor in all groups at first the grain was changed from whole oats to whole wheat. On this there was a marked improvement in egg production. The basal diet contained sufficient vitamin A for good egg production.

Chicks were reared on diets containing supplements of vitamin A or β-carotene or both and the vitamin A and carotene contents were estimated in eggs, yolk-sacs and livers from day-old chicks, in livers from month-old chicks and in the livers of the breeding stock killed at the end of the experiment. The rations were analysed for vitamin A and carotene content and samples of faeces from the breeding stock were examined also. Full details of the analytical methods are given in an appendix.

The results are summarized in a series of tables and are discussed in relation to practical considerations. Vitamin A from shark liver oil given as a supplement to a normal breeding ration tended to allow a slightly higher storage of vitamin A in the liver and yolk sacs of day-old chick than did β-carotene. Even with this good

store of vitamin A in the liver, mortality among chicks in the first four weeks of life was high unless a supplement of vitamin A or β -carotene was given with the starter ration which had a poor content of vitamin A. Chicks appeared not to depend on the reserve of vitamin A present on hatching and utilized the vitamin A or β -carotene supplied in the starter ration. Vitamin A was used more efficiently than β -carotene during the first four weeks of life.—A. M. COPPING.

CHAVANCE, J. (1944.) Le rachitisme dans les hernies juvéniles et dans les renversements du vagin. [Hernia and prolapse of the vagina in cases of rickets.]—*Rec. Méd. vét.* 120, 89-93. 2321

The frequent occurrence is noted of umbilical and inguinal hernias in calves, foals, goats and puppies with rachitic tendencies. Early treatment with Ca, P and vitamin D was usually effective and prophylactic treatment before, or immediately after, birth is recommended.

Prolapse of the vagina in cows and ewes is thought also to be a manifestation of rachitic tendencies due to failure of muscle tone. Treatment with vitamin D, or better housing and more exposure to sunlight is advocated.—A. M. COPPING.

HIBBS, J. W., KRAUSS, W. E., MONROE, C. F., & POUNDEN, W. D. (1945.) A report on the occurrence of rickets in calves under farm conditions.—*Bi-m. Bull. Ohio agric. Exp. Sta.* 30, No. 232, 3-8. Reprinted in *J. Dairy Sci.* 28, 525-529. (1945.) 2322

Nine autumn-born calves reared on their mothers and fed a very liberal ration of grain with access to lucerne and timothy hay were found to be severely affected with rickets at 3-6 months old. The diagnosis was confirmed by the low serum Ca and P and high phosphatase values. Treatment consisted of massive doses of 500,000 units of vitamin D daily for a week in the form of irradiated yeast, followed by a more balanced diet containing adequate vitamin D. One calf died but the others gradually recovered and photographs taken some two years later showed them to be almost normal in appearance, although two still showed slight abnormal curvatures of the neck and back. This suggests that if the disease is too far advanced before vitamin D therapy is given the skeletal changes become more or less permanent. The authors draw attention to the lack of sunlight and low vitamin D content of winter milk and recommend the inclusion of vitamin D supplements in the rations of growing calves, especially those born in the fall of the year.—A. EDEN.

ZUCKER, T. F., BERG, B. N., & ZUCKER, L. M. (1945.) Nutritional effects on the gastric mucosa of the rat. I. Lesions of the antrum. II. Lesions of the fundus and rumen.—*J. Nutrit.* 30, 301-317 & 319-331. 2323

I. When rats received a particular range of stock laboratory diet lacking in Ca, about 90% of them showed lesions of the antrum (the prepyloric region of the stomach). Control animals on a diet containing an adequate amount of Ca (0.6%) had a normal gastric mucosa. The lesions consisted of necrosis, haemorrhage and epithelial hyperplasia. Such lesions were observed also with levels of Ca up to 0.2% in the diet. Administration of vitamin D reduced the number of lesions, but did not prevent them if the Ca content of the diet was extremely low. A deficiency of thiamine or vitamin B complex produced similar results, but the lesions developed more slowly and were less prominent than those found in Ca deficiency. These lesions were cured by the ingestion of Ca, but thiamine was ineffective in preventing those resulting from the Ca-deficient diets. Neutralization of the gastric acidity by means of bicarbonate, phosphates or alumin-

ium hydroxide had no beneficial effect. In fact the phosphate accentuated the lesions. It is improbable therefore that gastric HCl plays a role in the formation of the lesions.

II. In this study haemorrhages in the fundus developed when rats were given laboratory stock diet used in I but deficient in varying amounts of the vitamin B complex. The data obtained indicated that the lesions were not related to deficiency of any one essential nutrient, but were due rather to a physiological response, vascular or nervous, to the decreased food consumption which resulted. Hyperplasia and keratosis of the rumen were found in diets low in casein, in vitamin A or in certain members of the vitamin B complex, but vitamin A did not prevent them even when present in more than adequate amounts. They could be prevented in a diet totally deficient in vitamin B by increasing the (purified) casein content to 27%. It is suggested that the occurrence of lesions in the rumen may be associated with a deficiency of cystine or some other amino acid, or alternatively, of an unknown factor, which is reduced in amount, or removed, during the purification of casein.—E. M. CRUICKSHANK.

EVANS, R. J., & BRANT, A. W. (1945.) Calcium, phosphorus, and vitamin D inter-relationships in turkey poult nutrition.—*Poult. Sci.* 24, 404-407. 2324

An interrelationship was observed between the levels of Ca, P and vitamin D in the diet of turkey poults. Changing the level of any one within certain limits appeared to alter the requirements of the others for optimum growth and calcification. The inter-relationships were masked at higher levels of vitamin D, the effect of changes in Ca and P levels being then slight. When the diet contained 160 A.O.A.C. [Assoc. Official Agricultural Chemists] chick units of vitamin D, levels of 0.6% Ca and 0.6% P were sufficient for optimum growth and calcification. On the other hands when the diet contained only 50 units of vitamin D, 2 or 3% of Ca and 1% of P were necessary. The level of Ca and P in the diet appeared to have a greater influence than the Ca:P ratio, the best results being obtained when the Ca and P levels were 2-3% and 1%, respectively.—E. M. CRUICKSHANK.

PENCE, J. W., MILLER, R. C., DUTCHER, R. A., & ZIEGLER, P. T. (1945.) The rapidity of the storage of thiamine and its retention in pork muscle.—*J. Anim. Sci.* 4, 141-145. 2325

Ingested thiamine was rapidly stores in pork muscle. In pigs receiving 50 mg. daily, the thiamine content of the muscle was definitely increased within eight days and was doubled in 35 days. Saturation appeared to have been reached at this point, since no further increase in thiamine content was observed in the muscle of pigs fed thiamine for 155 days. In contrast to the findings with other species, the extra thiamine stored in the muscle was retained for some time after the cessation of thiamine feeding. Occasionally pigs with a low capacity for storage of the vitamin were encountered.—E. M. CRUICKSHANK.

HEGSTED, D. M., & STARE, F. J. (1945.) Nutritional studies with the duck. I. Purified rations for the duck.—*J. Nutrit.* 30, 37-44. 2326

HEGSTED, D. M., & RAO, M. N. (1945.) Nutritional studies with the duck. II. Pyridoxine deficiency.—*Ibid.* 367-374. 2327

I. A basal purified diet (A), containing sucrose, casein (18%), salts and maize oil together with a vitamin mixture minus biotin, and a diet (B), similar to A but containing 10% gelatin, were fed to ducklings. Gains in weight on diets (A) and (B) were 2.1 g. and 7.8 g.

per day, respectively, as compared with 33.4 g. on a commercial ration. Food utilization on these diets was as follows:—(A), 15%, (B), 15%, control, 50%. The addition of liver extract to these diets greatly improved growth, though this was still not optimum. The necessary factor present in the liver extract was similar to the eluate factor required by the chick. When this was lacking growth was poor and anaemia sometimes developed. Amino acids additional to those supplied by 18% casein were required; these were better supplied by gelatin than by additional casein. Biotin was required by the duck, but in its absence no symptoms other than poor growth were observed.

II. When a basal ration deficient in pyridoxine was fed to four-day-old ducklings growth was very poor and severe anaemia developed, but no dermatitis or nervous symptoms were observed. The requirement for pyridoxine was similar to that of chicks, *viz.* 250 µg. per g. of ration. Birds 2–3 weeks old, which had been reared on a commercial ration, developed pyridoxine deficiency within a few days after being transferred to the basal ration. The deficiency was characterized by an immediate failure in growth, poor feathering, paralysis and convulsions. The blood picture showed a drop in haemoglobin, red cell count and haematocrit, but the decrease in these three was not proportional, so that the anaemia, as shown by the calculation of mean cell value, was microcytic in type. Administration of pyridoxine readily improved growth and restored the blood picture to normal.—E. M. CRUICKSHANK.

FOLLIS, R. H., JR., & WINTROBE, H. W. (1945). A comparison of the effects of pyridoxine and pantothenic acid deficiencies on the nervous tissues of swine.—*J. exp. Med.* 81. 539–552. 2328

Pigs fed on diets deficient in pyridoxine or pantothenic acid develop ataxia and lesions are found in the sensory neurones. Pyridoxine deficiency is characterized by early degeneration in the peripheral processes of the sensory neurone, while pantothenic acid deficiency is first recognizable, from a histological point of view, by chromatolysis.—A. T. PHILLIPSON.

CARTER, C. W., MACFARLANE, R. G., O'BRIEN, J. R. P., ROBB-SMITH, A. H. T., & AMOS, B. (1945). Anaemia of nutritional origin in the rat.—*Biochem. J.* 39. 339–347. 2329

Two types of nutritional anaemia are described which differ in blood morphology and in biochemical origin. One of these developed after 8–16 weeks in about 60% of rats on a diet deficient in pantothenic acid and was characterized by a fall of haemoglobin, erythrocytes and polymorphonuclear leucocytes. P.M., there was splenomegaly with myeloid transformation. Pantothenic acid, when administered at an early stage, restored the blood picture to normal in a proportion of cases. The second type of anaemia developed in animals which had received pantothenic acid throughout the experimental period. The significance of this anaemia is at present uncertain and is being further investigated.—E. M. CRUICKSHANK.

MARCENAC. (1946). Conséquences des restrictions alimentaires de la période de guerre sur la pathologie des animaux.—[Effect of war rationing on disease in animals.]—*Rev. Path. comp.* 46. 139–147. 2330

Malnutrition of domestic animals in France during 1940–45 seriously affected their health, condition and productivity. Besides their gross energy intake being greatly diminished, animals suffered from diets too low in vitamins and proteins, from mineral imbalance and from excess of raw fibrous foods of low digestibility and palatability, the nature of low quality fodders often being disguised by their being finely ground and

incorporated into compound foods. Town animals suffered even more severely than those in the country, where the standard of agriculture deteriorated and the production of forage was much lower than formerly.

Illnesses and infections amongst stock increased greatly and were of a higher order of severity than in pre-war years. The effects of malnutrition were observed in every physiological system and organ of all species of animals. The general state of ill-health was further intensified by the fact that tired and emaciated animals were called upon to do more than before and their shortcomings laid heavier burdens on the fitter animals so that they too deteriorated. Dietary errors further led to diminished fertility and fecundity, greater mortality among the young and to an increased incidence of rickets and incurable osteodystrophic disorders. Emphasis is laid on the need for intensified efforts in the future to repair the ravages in health of the livestock industry in France.—A. EDEN.

DRIEUX, H., & THIERY, G. (1943). Cortico-épinephrose calcifiante chez les chats cachectiques. [Calcifying cortico-epinephrosis in cachectic cats.]—*Bull. Acad. vét. Fr.* 16. 326–337. 2331

The sacrifice of many domestic pets owing to the extreme scarcity of food in France during the war enabled the authors to make comparative autopsies of a large number of cats and dogs, whose bodily condition varied from a state of good nutrition to that of extreme cachexia. In particular, they studied a lesion, apparently peculiar to cats, which was characterized by innumerable calcified foci of degeneration affecting the adrenal cortices of cachectic cats of all ages and both sexes. The lesions always occurred in both adrenals but in contrast to BRUSCHWEILER (1924), the authors encountered no case where there were concurrent lesions in the medulla. Some earlier observers of this particular pathological condition are also cited.

Calcified lesions of the adrenal cortices were observed in 44 out of 50 cachectic cats whereas similar lesions were noted in only six out of 77 cats slaughtered in a good state of nutrition; at least two of the six animals had histories of chronic illness. The affected adrenals appeared to be normal in colour and size or only very slightly contracted. The capsule was usually smooth except in 10% of cases where it was irregularly granular. The calcified foci varied extremely in size and number. The largest concretions were about the size of a pin's head; some were dissected out and analysed and were found to consist of CaCO_3 .

The microscopic characters of acute and chronic types of cortical lesions are described, but both types were encountered in all degrees of severity and, in some cases, the histological picture suggested the imposition of an acute degenerative change upon an older chronic condition.

The acute or rapidly developing type of lesion was confined to the zona glomerulosa and to the superficial part of the zona fasciculata. Each focus of degenerative change presented a network of collagen fibrils containing within its meshes a structureless and poorly staining matrix strewn with vacuolated nuclear debris. Within the matrix the presence of droplets of cholesterol fat could be demonstrated by examination in polarized light or staining with Sudan III. Treatment of sections with alizarin showed that calcification had proceeded by the uniform deposition of very finely grained calcareous material. On staining with silver nitrate, black bands up to 100 µ in thickness developed around each focus of degeneration most probably in consequence of the previous accumulation of ascorbic acid at these sites. No blood vessels or inflammation appeared in the lesions, but congestion was frequently seen in other-

wise normal regions of the cortex where the sinusoids were apparently dilated and engorged with blood cells.

Contrasting sharply with the microscopic findings in the acute condition, the chronic degenerative foci were always found to commence deep down in the zona reticularis, close to the connective tissue layer separating this zone from the medulla. Only in advanced cases did the lesions invade the entire cortex. Another important distinguishing feature of the chronic condition was a marked connective tissue hyperplasia and some histological pictures were even suggestive of a metaplasia of the cortical cells to a connective tissue type. Cholesterophanerosis was more marked, cholesterol fat being so abundant at the periphery of each lesion as to form a more or less large ring, while small droplets

could be seen in cells before atrophy had occurred. Calcification also differed as indicated by the deposition of irregular masses of larger particles which completely masked the centres of the lesions. Material resembling ascorbic acid, however, was not always noted. Finally, in the remaining normal tissue, several foci of adenomatous hyperplasia were observed and these were considered to indicate a compensatory and regenerative effort on the part of the affected parenchyma.

Neither the pathogenesis of this calcifying lesion of the adrenal nor the reasons for its apparent restriction to the cat are known. The authors discuss certain hypotheses, some of which they intend to test by experiment.—W. R. MUIR.

See also absts. 2307 (nutrition of swine), 2409 (mineral deficiencies in arid and semi-arid climates), 2386 (nicotinic acid, nicotinamide), 2274 (ascorbic acid), 2343 (cholesterol, vitamin E).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

DEMPSEY, E. W., & WISLOCKI, G. B. (1946.) Histochemical contributions to physiology.—*Physiol. Rev.* 26. 1-27. 2332

By means of a few selected samples the authors show how the application of histochemical and cytochemical methods can provide data of importance for the understanding of cellular activity. The fixative employed and the acidity of the staining reagents exert profound effects on the staining properties of histological material. The particular histochemical methods which are dealt with in some detail include the recognition of nucleoproteins (Feulgen reaction, use of crystalline ribonuclease, ultraviolet microscopy and spectrophotometry), the demonstration of lipoidal materials (Sudan stains, Smith-Dietrich test, saponification, tests for steroid hormones), and enzymic reactions (oxidases and peroxidases, dopa oxidase, phosphatases). As further samples of the possible application of histochemical methods there is a discussion of the relationships of nucleoproteins to protein synthesis and to phosphatase activity, and of phosphatase to glycogenesis.—E. G. WHITE

GOMORI, G. (1946.) Distribution of lipase in the tissues under normal and under pathologic conditions.—*Arch. Path.* 41. 121-129. 2333

This paper gives an account, illustrated by photomicrographs, of the distribution of lipase in a number of the tissues and organs of man, monkey, dog, rabbit, g. pig and rat, and also in various pathological conditions, inflammatory and neoplastic, from biopsy and autopsy material. A full description is given of the technique, slightly modified from the original: the principal stages comprised fixation in acetone at 0°C., impregnation in cellulose acetate, embedding in paraffin, incubating at 37°C. with a suitable substrate, treating with lead nitrate followed by ammonium sulphide and staining with haematoxylin and eosin.

Lipase was associated with cytoplasmic granules and none was detectable in the nucleus. The pattern of distribution was remarkably constant in the same organ or tissue for any one species and all substrates used gave identical pictures. Differences between species were very marked. Inflammatory changes caused no change in the lipase distribution unless accompanied by necrosis: necrotic tissue was almost or entirely free from lipase. In fatty degeneration of the kidney and myocardium no lipase was present and fatty livers contained less lipase than normal liver. The epithelioid cells and giant cells in tuberculous lesions were rich in lipase but the necrotic centre of the lesions contained none. Of a large number of neoplasms

examined almost all were completely free from lipase activity.—E. G. WHITE.

*LACKENBUCHER, G. (1942.) Über das Verhältnis des Gesamt-Stickstoffes zum Chlorgehalt im Blute nach grossen Aderlässen. [The relation of the total nitrogen and chlorine contents of the blood in haemorrhage.]—*Inaug. Diss., Vienna*. [Abst. from abst. in *Wien. tierärztl. Mschr.* 29. 478-479.] 2334

The plasma protein concentration in three dogs with haemorrhage decreased to a minimum within 24 hours after venesection and rose to normal again within 8-10 days. The blood chloride concentration increased above the normal fasting level to a maximum within four hours and became normal in eight days; its increase was due to the rapid replacement of plasma and the lowered corpuscle count, since plasma has an average chloride content of 540 mg. % and corpuscles an average of 117 mg. %.—E. F. MCCARTHY.

VICKERY, H. B. (1944.) The histidine content of adult and fetal bovine hemoglobin.—*J. biol. Chem.* 156. 283-287. 2335

Analysis of the samples of foetal and adult bovine haemoglobin showed that the proportion of histidine was higher in the adult than in the foetal haemoglobin, the values being $6.81 \pm 0.05\%$ and $6.43 \pm 0.04\%$ histidine respectively.

Comparison with the histidine values for haemoglobins from the adult human being, horse and sheep showed that all these kinds of haemoglobin differ from each other in histidine content.—R. ALLCROFT.

WOODBURY, R. A., & ABREU, B. E. (1944.) Influence of dying gasps, yawns and sighs on blood pressure and blood flow.—*Amer. J. Physiol.* 142. 721-726. 2336

The authors described previously the circulatory changes which accompany crying, coughing and straining: in the present paper they deal with the effects of deep breathing and dying gasps produced in dogs narcotized with morphine. Pressures in the ventricles were recorded by sounds inserted in the carotid artery and jugular vein. Normal inspiration increased the venous return to the right heart and also caused larger and more effective ejection. Dying gasps and deep breathing greatly increased the venous return, the former being able to pump blood through the lungs and provide a temporary flow of blood to the vital areas (C.N.S. and heart) after the heart had stopped beating. Net pressures as high as 40-50 mm. Hg were created in the arteries of the lung, heart and C.N.S. by dying gasps occurring in dogs after cardiac arrest had ceased.

—E. G. WHITE.

MATA, E. G. (1944.) El descubrimiento del celo en las hembras domésticas. [Detection of oestrus in domestic animals.]—*Inst. Zootec., Fac. Agron. Vet., Univ. B. Aires.* 2. No. 2. 59-185. [English & Portuguese summaries.] 2337

This monograph deals with the detection of oestrus in sheep, cattle and horses and its practical application in the livestock industry. Each species is discussed separately, and in each case there is a very full description of the mechanism of the oestrous cycle, the microscopic and gross changes in the vagina and uterine cervix, the relationship between oestrus and ovulation, and the detection of heat by the use of vasectomised males. The operation of vasectomy for this purpose is fully described.

There is an extensive bibliography of the literature of sex physiology in the domestic animals.—I. W. J.

VIDELA, P. H. B. (1944.) Fecundidad del pura sangre de carrera en la República Argentina. [Fertility of pure-bred Argentine race horses.]—*Inst. Zootec., Fac. Agron. Vet., Univ. B. Aires.* 2. No. 3. pp. 191-237. [English summary.] 2338

The author studied the breeding records of 1,000 brood mares in 30 studs in the Argentine over several years. He found that the average number of mares which conceived each year was 62.75% of the total. 55% of the total produced live foals, 3% aborted, 5% gave birth to dead foals and the remaining 37% failed to conceive.

The results compare unfavourably with those of other leading horse-breeding countries; in Australia, for example, the conception rate is 73.6% and there are live births in 68.9%; in Great Britain the conception rate is 68.8% and there are live births in 61.5%.

The stallions are not considered to be the dominating factor in the relatively low breeding figures obtained in the Argentine. V. believes that improvement will take place as a result of closer attention to feeding and general management and in particular to modern scientific principles of breeding.—I. W. JENNINGS.

ANDERSON, J. (1945.) Seasonal variation in the reproductive capacity of the bull.—*J. agric. Sci.* 35. 184-196. 2339

The results of regular weekly examinations of semen collected from 11 bulls over a period of more than two years are tabulated and correlated with seasonal variations in temperature, relative humidity and total hours of sunshine and rainfall. These results are supplemented by the results of similar examinations made by other observers on two ranches in the vicinity. The bulls included Ayrshires, both pure and grade, Aberdeen Angus, Hereford, Sussex, both pure and grade, and Friesian.

The feeding and management of the bulls and the technique used in collecting and examining the samples of semen are described. The findings are given in detail in a series of tables and are fully discussed. Seasonal variations in density and mortality of the sperm, the pH of the semen and the percentage of ejaculations performed were well marked, but there was considerable variation in different years in the periods of maximal and minimal types of semen.

There appears to be a seasonal rhythm associated with climatic factors; warmer conditions cause stimulation and *vice versa*. Nutritional factors may, however, modify this rhythm. In general, there is a seasonal similarity between sperm quality and fertility but this can be disturbed by variations in the reproductive efficiency of the cows inseminated. The cows are sometimes subjected to nutritional stresses from which the stud bulls are protected.

The seasonal features in the bulls are very similar

to those shown by zebu and grade cows in Kenya which were reported earlier (ANDERSON, 1943).—M. C.

VOLLMANN, R., & VOLLMANN, U. (1942.) Vergleichende Temperaturuntersuchungen zur Reproduktionsphysiologie der Frau und der Kuh. [Observations concerning the physiology of reproduction in women and cows.]—*Schweiz. Arch. Tierheilk.* 84. 403-418 & 450-466. 2340

The basal body temperature of women may be divided into a high pre- and low post-menstrual phase with reference to the mean temperature. The pre-menstrual phase persists for 12 ± 3 days. The post-menstrual phase has a linear relationship to the length of the cycle. A diphasic temperature curve also observed in cows indicated the low temperature phase in pro-oestrus and early metoestrus and elevated temperature at the height of metoestrus. The typical curve was not present in some 40% of cases exhibiting oestrus symptoms. The temperature curve in women reaches a maximum at the beginning and in the cow at the end of gestation. A sudden fall in temperature 2-3 days before the end of gestation permits prediction of the time of birth.—E. F. MCCARTHY.

*CSIKI, V. (1942.) [Pregnancy diagnosis in the domesticated buffalo.]—*Inaug. Diss., Budapest.* pp. 28. [Abst. from abst. in *Jber. Vet.-Med.* 70. 543.] 2341

Intra-uterine development is slower in the buffalo than in the cow. Pregnancy can be diagnosed by manual examination after three months' gestation. The Allen and Doisy and Hermann Fellner reactions are positive after 100 days. Oestrone is absent from the urine towards the end of gestation. The Cuboni reaction is positive after 100 days.—E. F. MCCARTHY.

SALISBURY, G. W., & VANDEMARK, N. L. (1945.) Stimulation of livability and glycolysis by additions of glucose to the egg yolk-citrate diluent for ejaculated bovine semen.—*Amer. J. Physiol.* 143. 692-697. 2342

Studies were made on the effect of adding glucose to egg-yolk citrate diluent for bull semen. One part of freshly collected bull semen was diluted with four parts of the diluent; glucose was added at levels of 58 and 116 mg. % of diluted semen, and incubation was carried out for one hour at 46.5°C. or, alternatively, the diluted semen plus glucose was stored for ten days at 5°C.

Added glucose was found to promote lactic acid production and to increase the viability of the spermatozoa either after incubation or during cold storage for ten days. Although the initial glucose stores of the diluted semen samples were not depleted, stimulation of lactic acid production and motility duration occurred. Irrespective of the quality of the semen employed the rate of glucose loss during storage at 5°C. was essentially the same in three separate experiments. The rate of glucose loss was not directly related to the life period of the spermatozoa unless the sugar lost was glycolysed to lactic acid. The extent to which the loss of glucose was recovered as lactic acid depended upon the quality of the semen used and also upon the length of time of storage, the figures ranging from less than 25 to 100%. During low temperature storage, especially in the absence of added glucose, more lactic acid was recovered than was accounted for by the glucose loss.—A. EDEN.

GABEL, W. (1943.) Zur Biochemie der steroiden Sexualwirkstoffe. [Biochemistry of steroid sex hormones.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 51/49. 188-191. 2343

Possible modes of steroid sex hormone formation from cholesterol are reviewed with the aid of structural

formulae. The physiological properties of oestrogenic and androgenic substances, progesterone and the relevant aspects of anterior pituitary activity are discussed at length. Sex hormone therapy and vitamin E function are also considered.—E. F. MCCARTHY.

DRANSFIELD, J. W. (1945.) The lymphatic system of the domestic fowl.—*Vet. J.* 101. 171-179. 2344

The thesis of which this paper is a summary gives the only account in English of the lymphatic system of the domestic fowl. D. deals with his subject in great detail and illustrates the paper with ten excellent drawings. A fluid consisting of "Prussian blue" mixed to a paste in turpentine and suspended in ether was used to facilitate examination of the course of the lymphatics; being injected into the tissue under examination with a needle 0.25 mm. in diameter; a dissecting microscope was used to follow the courses of all but the largest lymphatics.

See also absts. 2297 (acclimatization), 2387 (hormones), 2399 (blood sugar), 2414 (artificial insemination in Trinidad and Tobago).

POISONS AND POISONING

SOLOMIDIS, J. (1945.) Action de l'eau et du sérum de lapin sur les propriétés toxiques et antigéniques de la glycérine. [The effect of water and rabbit serum on the toxic and antigenic properties of glycerin].—*C. R. Soc. Biol. Paris.* 139. 10-12. 2345

Previous work by the same author showed that glycerin diluted in an equal volume of water not only loses most of its toxicity, but also the immunizing and anaphylactic properties with which it has been credited.

The present paper describes a study firstly, of the action of water upon the physiological properties of glycerin and secondly, of the action of rabbit serum, either normal, or modified by heat or by dilution in saline. In general, rabbits inoculated intravenously with small doses of glycerin died in from 5-18 days, at which time the level of urea in the blood exceeded 1 g. per litre, whereas rabbits inoculated under similar conditions with glycerin to which 10% of water has been added rarely succumbed and their blood urea level never exceeding 1 g. per litre. It was found that rabbits injected with glycerin diluted in an equal volume of rabbit serum died in 12-16 days, but if the serum was robbed of its proteins by heat, followed by filtration, the toxic effects failed to appear and the urea content of the blood did not undergo any appreciable variation.

It is suggested that the loss of toxicity of glycerin after its dilution in water is due to molecular depolymerization and the fact that serum cleared of its heat coagulated proteins has the same effect suggests that the polymerized molecules of glycerin are capable of combining with the proteins of rabbit serum.—J. C. B.

See also absts. 2296 (lead poisoning in calves), 2289, 2290 (toxic polysaccharide from *Chromobact. prodigiosum*), 2313 (toxic origin of canine hysteria), 2316 (molybdenum), 2397 (food poisoning).

PHARMACOLOGY, THERAPEUTICS AND DISINFECTION

DUBOS, R. J. (1945.) The mode of action of chemotherapeutic agents.—*Bull. N. Y. Acad. Med.* 21. 27-36. 2348

EHRlich had suggested that arsenicals combined with sulphydryl groups of cell proteins. Antiseptic dyes combine with acid or basic cellular components. The further development of the theory of chemotherapy depended on the "lock and key" relationship and competitive inhibition of enzymes, as illustrated by the neutralization of sulphanilamide action by *p*-aminobenzoic acid. Some therapeutic agents are bacteriostatic while others are bactericidal, but the ultimate

D. describes the lymphatics of the head, wing, legs and trunk. He shows that in the fowl the lymphatic system consists solely of an arrangement of lymphatic vessels following the course of the blood vessels and having several communications with the venous system in the anterior thoracic region. Lymph hearts were not observed in any of the specimens examined, but in some slight dilations were seen on the course of the lymphatics following the middle sacral artery. These dilations appeared to correspond in position to the lymph hearts in embryo birds and in the adults of those birds in which they persist. Lymph nodes are completely absent in the domestic fowl; D. agrees with other authorities that plexuses of the lymphatics appear to take the place of glands, although such plexuses are rare except on the course of the lymphatics of the abdominal viscera. Valves are present in the lymphatics of the fowl, but they are relatively few in number.

—J. D. BLAXLAND.

ROTTGARDT, A. A. (1944.) Fotosensibilización. [Photosensitization].—*An. Fac. Med. vet., Univ. La Plata.* 7. 49-124. 2346

This article begins with a discussion on sunlight, the spectrum, the good and harmful effects of the sun's rays, and photosensitizing substances.

The domestic animals are subject to local and general changes caused by the action of light and activated by the presence of other factors. Among these factors are photodynamic chemicals such as eosin, erythrosin and bengal rose, and the acridine and thiazine dyes. There are many plants which possess photodynamic action; and the plants in this class are fully described, together with their action on the various domestic animals. A general description of the symptoms and lesions produced in the animal body in photosensitization and the complications which may result is followed by a short section on prophylaxis and treatment.—I. W. JENNINGS.

EMMEL, M. W. (1943.) Daubentonia punicea (Cav.) DC. poisoning in pigeons.—*J. Amer. vet. med. Ass.* 102. 294-295. 2347

Details are given of the toxicity for pigeons of *D. punicea* seeds. Three pigeons died shortly after consuming 6, 12 and 18 seeds respectively, having shown symptoms of vomiting, diarrhoea and weakness. In acute cases there were necrotic lesions in the intestines, livers and kidneys. E. confirmed that the toxicity of these seeds varies from year to year.—A. BUXTON.

effect may depend upon environmental factors and the organism involved. While antiseptics have a gross protoplasmic poisoning action, most chemotherapeutic agents have a selective action on some specific metabolic process. Body constituents such as the phospholipoids may protect cells against the lethal action of drugs. At present there is no satisfactory *in vitro* "screening" method for the discovery of chemotherapeutic agents.

—E. BOYLAND.

FUHRMAN, F. A. (1946.) The effect of body temperature on drug action.—*Physiol. Rev.* 26. 247-274. 2349

This is a review of the more recent literature. Some of the more important substances considered include colchicine, digitalis and related substances, central nervous system stimulants and depressants, various hormones and miscellaneous substances such as acetylcholine, carbon dioxide, oxygen, procaine and cocaine. F. discusses their effects on poikilotherms and homeotherms at different temperatures and their effect on isolated tissues and hibernating animals. A considerable amount of the work relates to cats and dogs, but owing to the complexity of the effects of temperature upon the action of drugs, this review does not lend itself easily to further abstraction.—H. WILLIAMS SMITH.

LUCAS, E. H., & LEWIS, R. W. (1944.) Antibacterial substances in organs of higher plants.—*Science*. 100. 597-599. 2350

It is possible that the resistance which some plants have to infection is due to the presence of antibiotics. The antibacterial action of extracts of a number of species of plants was determined by measurement of the area of inhibited growth. Leaves of two-year-old Scotch thistles (*Onopordon acanthium*) of *Verbascum thapsus* and *Paonia officinalis* inhibited *Staphylococcus aureus*. In the test used, extracts of leaves of Cruciferae had no inhibitory action. Extracts of fruits of *Lonicera*, *Vaccinium*, *Ribes* and *Sorbus* inhibited growth of *Staph. aureus* and *Bacterium coli*.—E. BOYLAND.

FLOREY, H. W., JENNINGS, M. A., & SANDERS, A. G. (1945.) Biological investigations on proactinomycin. —*Brit. J. exp. Path.* 26. 337-349. 2351

Proactinomycin, antibiotic of *Proactinomyces (Nocardia) gardneri* inhibits Gram-positive organisms but not Gram-negative bacilli. The purified material was not very toxic to animal tissues but reduced the rate and amplitude of the contractions of the isolated cat heart. The intravenous injection of 20 mg. per kg. caused a prolonged rise in blood pressure, while the injection of smaller doses sometimes caused a rise and at other times a fall in blood pressure. In dilutions of 1:25,000 it reduced the rhythmic contractions of the isolated g. pig uterus. Although it was more toxic than penicillin it was absorbed from the alimentary tract and inhibited the growth of penicillin-resistant staphylococci. —E. BOYLAND.

NEGRONI, P. (1944.) Estudios sobre la penicilina. I. Influencia de algunos factores físicos y químicos. [Studies on penicillin. I. Influence of various physical and chemical factors.]—*Rev. Inst. bact., B. Aires*. 12. 299-308. [English & French summaries.] 2352

NEGRONI, P., & FISCHER, I. (1944.) Estudio sobre la acción inhibitoria del *Penicillium notatum*. II. Influencia de la fuente carbonada de nutrición. III. Influencia de la fuente de nutrición nitrogenada. [Study of the inhibitory action of *Penicillium notatum*. II. Influence of various sources of carbon in the culture medium. III. Influence of various sources of nitrogen in the culture medium.]—*Ibid.* 369-373 & 374-378. [English & French summaries.] 2353

I. Penicillin can be extracted with distilled water from cultures growing on solid medium. The presence of salts or glucose in the medium and cultivation in an atmosphere of 20% CO₂ reduce penicillin formation. The addition of hydrolysed yeast does not influence penicillin production. There seems to be a relationship between sporulation and penicillin titre, since well-developed cultures are rich in penicillin. Growth is good in liquid media covered with a layer of filter paper, but a cellophane cover reduces the titre.

II. Growth of penicillium in Czapek's medium is favoured by the addition of starch, which stimulates

abundant growth and sporulation of the fungus. It is also favoured by the provision of an extensive surface area for growth. Glucose, maize-meal water and sodium citrate are not good sources of carbon, neither does zinc sulphate favour growth. Acidity in the medium inhibits the formation of penicillin and destroys any which is already formed. Penicillin production is at its maximum after ten days' growth of the penicillium culture, when all the sugar has been oxidized, and the starch hydrolysed.

III. The nitrogen source seems to be of great importance in penicillin production. Peptone appears to be the best source of nitrogen and a medium containing 1% peptone, 0.5% starch and 2.5% hydrolysed casein is very suitable for penicillin formation. The addition of vitamin B₁ to the culture medium has no influence on the antibiotic titre.—I. W. JENNINGS.

FISHER, A. M. (1945.) The therapeutic value of penicillin applied locally, based on experience with the crude material in a variety of infections.—*Johns Hopk. Hosp. Bull.* 76. 134-153. 2354

Good results were obtained in 63% of 95 human cases of local infections treated by local application of crude penicillin. The best responses were obtained in acute cases or chronic cases following surgical drainage and removal of all dead tissue. Treatment by local application of penicillin should be combined with other methods, such as application of other antibacterial agents or parenteral administration of pure penicillin. If possible, the type of infection should be diagnosed and the sensitivity of the infecting organisms to penicillin tested.—E. BOYLAND.

BLAIR, J. E., CARR, M., & BUCHMAN, J. (1946.) The action of penicillin on staphylococci.—*J. Immunol.* 52. 281-292. 2355

Although most coagulase-positive cultures of *Staphylococcus aureus* are susceptible to penicillin, a few strains have a high natural resistance; resistance may also be developed by growth in progressively increasing concentrations of penicillin in broth. If organisms develop resistance either by treatment in broth or during penicillin therapy they may have a lower metabolic rate, but their pathogenicity and coagulase reaction remain. The resistance appears to be permanent. Penicillin does not inhibit the formation of the alpha-toxin and does not modify the effect of the existing toxin.—E. B.

CAVALLITO, C. J., BAILEY, J. H., HASKELL, T. H., MCCORMICK, J. R., & WARNER, W. F. (1945.) The inactivation of antibacterial agents and their mechanism of action.—*J. Bact.* 50. 61-69. 2356

Sulphydryl compounds such as cysteine and β -(dimethylamino)-ethanethiol are able to inactivate antibacterial agents such as penicillin, the antibacterial principle of *Allium sativum*, mercuric chloride and pyocyanine. The fact that this inactivation occurs indicates that these antibacterial agents act through essential sulphydryl groups of bacterial enzymes.—E. B.

MOLDAVSKY, L. F., HASSELBROCK, W. B., CATENO, C., & GOODWIN, D. (1945.) Studies in mechanisms of penicillin action. I. Penicillin effects on blood coagulation.—*Science*. 102. 38-40. 2357

The injection or oral administration of penicillin causes an immediate decrease in blood clotting time of patients. Penicillin also reduces the bleeding time. Penicillin treatment therefore increases the danger of thrombus formation. Penicillin might be of value in treatment of certain haemorrhagic disorders.—E. B.

KLEIN, M., & KALTER, S. S. (1946.) The combined action of penicillin and the sulfonamides *in vitro*: the nature of the reaction.—*J. Bact.* 51. 95-105. [Authors' summary copied verbatim.] 2358

Ten sulphonamide-resistant and sulphonamide-susceptible strains of *Staphylococcus aureus* and eight gram-negative rods were tested for their susceptibility to the combined action of penicillin and sulphonamides.

The *in vitro* combination of sulphathiazole, sulphadiazine, or sulphapyrazine and penicillin resulted in an increase in the penicillin titer only if both agents were present in inhibitory concentrations.

A marked delay in penicillin activity was observed when this compound was added to a bacterial culture 5 hours after the sulphathiazole. No other *in vitro* evidence of antagonism between the sulphonamides and penicillin was observed.

The additive effect of penicillin and sulphonamide inhibitions is interpreted as a result of the reduction by penicillin of the total number of bacterial cells to limits within which the sulphonamide becomes completely inhibitory.

MACLEOD, C. M., & STONE, E. R. (1945.) Differences in the nature of antibacterial action of the sulphonamides and penicillin and their relation to therapy.—*Bull. N. Y. Acad. Med.* 21. 375-388. 2359

Sulphonamides are strictly bacteriostatic and require participation of antibodies and phagocytes for therapy. Although penicillin is bactericidal in the body, specific immunity may be a very desirable adjunct to therapy. Different strains of organisms vary in susceptibility *in vivo* and the susceptibility may be different from that *in vitro*. Failure of therapy might be due to the presence of sulphonamide inhibitors, an unfavourable pH, the development of fastness, or the absence of immunological or phagocyte response. Under certain conditions the immediate antibacterial effect of penicillin compared with delayed action of sulphonamides may be of importance in the choice of drug.—E. BOYLAND.

FELDMAN, W. H., & HINSHAW, H. C. (1945.) Streptothricin in experimental tuberculosis.—*Amer. Rev. Tuberc.* 52. 299-303. [Spanish summary.] 2360

Streptothricin, which is an antibiotic produced by *Actinomyces laevis*, inhibits the growth of *Mycobacterium tuberculosis* *in vitro* but has no therapeutic effect against TB. in g. pigs when tested under conditions in which streptomycin is effective. Streptothricin was more toxic than streptomycin when given repeatedly to g. pigs.—E. BOYLAND.

FELDMAN, W. H., HINSHAW, H. C., & MANN, F. C. (1945.) Streptomycin in experimental tuberculosis.—*Amer. Rev. Tuberc.* 52. 269-298. [Spanish summary.] 2361

When streptomycin was injected subcutaneously into g. pigs 4-6 times daily it inhibited the progress of infections of human type *Mycobact. tuberculosis*. In one experiment in which treatment with 6,000 units daily was commenced 48 days after infection and carried on for a further 166 days, 70% of the untreated g. pigs and only 8% of treated g. pigs died. Streptomycin was not very toxic to g. pigs and was able to resolve or suppress established infections but not to cure infections completely. In about 40% of successfully treated infected animals the sensitivity to tuberculin was removed.

—E. BOYLAND.

CHU, H. P., & SHENG, T. S. (1944.) The effect of sulfanilamide, sulfapyridine and sulfathiazole on the glands bacilli *in vitro*.—*J. Anim. Husb. vet. Sci., China.* 4. 27-32. [In Chinese: English summary.] 2362

Three strains of the glands bacillus, two smooth ("Lanchow B" and "Chacho") and one rough (No. 86), were used in this test. The medium consisted of ordinary infusion broth containing 3% of glycerin and 0.5% of peptone, with a pH of 7.6.

No growth could be detected with the naked eye after four days' incubation of the culture with 15-30 mg. % of sulphanilamide or 10 mg. % of sulphapyridine, or 5 mg. % of sulphathiazole. When the concentrations were increased to 50 mg. %, 15 mg. % and 10 mg. % respectively, no growth could be seen even after an incubation period of ten days. The bacteriostatic power was said to be greater against the slowly growing smooth strains than against the rapidly growing rough strain.

A concentration of 50-300 mg. % of the drugs was effective in killing organisms of the smooth type. The effect of sulphanilamide on certain organisms, e.g., *Brucella abortus*, is counteracted by a large inoculum; with a large inoculum of *Pfeifferella mallei*, however, its effect is merely diminished. The authors suggest that this may be due to the fact that these organisms grow rather slowly. Before they can produce any substance which inhibits the action of the drug, they are already affected by it.—S. J. CHU.

COCEANI, A. (1942.) Saggi di terapia con "Farma 939" nella tripanosomiasi da soudanense. ["Farma 939" in chemotherapy of trypanosomiasis.]—*Boll. Soc. ital. Med. ig. trop. (Ses. Eritrea), Asmara.* 1. No. 2. Reprint pp. 7. 2363

In this short paper, which includes case records of experimental infection with *Trypanosoma soudanense* in four dogs and natural infection in one camel, the Italian proprietary drug "Farma 939" of undisclosed composition is claimed to have effected cures.—J. E. EAGLE, H. (1945.) The spirochaetocidal and trypanocidal action of acid-substituted phenyl arsenoxides as a function of pH and dissociation constants.—*J. Pharmacol.* 85. 265-282. 2364

The trypanocidal and spirochaetocidal action of acid substituted derivatives of phenyl arsenoxides (e.g., sulphonylphenyl arsenoxide) increases with decrease in pH from 9.0 to 5.5. This was because the ionized salts are less active than the undissociated free acids. The activity against *Treponema pallidum* or *Trypanosoma equiperdum* could be predicted from the calculated concentrations of the undissociated acids. The undissociated molecules are strongly absorbed by the organisms, probably because they can penetrate the cell membrane.—E. BOYLAND.

ALICATA, J. E., & WILLETT, E. L. (1946.) Observations on the prophylactic and curative value of sulfa-guanidine in swine coccidiosis.—*Amer. J. vet. Res.* 7. 94-100. 2365

The prophylactic use of sulphaguanidine mixed with the feed at the rate of 1 g. per 10 lb. body weight inhibited the cycle of development of *Eimeria debilecki* and *E. scabra* and prevented symptoms associated with these infections. When used as a cure, sulphaguanidine was found to bring about a reduction in oocyst output and a quicker termination of the diarrhoeal condition.—C. HORTON SMITH.

I. ASPLIN, F. D., BOYLAND, E., & HORTON-SMITH, C. (1946.) Treatment of caecal coccidiosis of chickens by sulphonamides.—*Biochem. J.* 40. No. 1. ii-iii. 2366

II. HORTON SMITH, C., & BOYLAND, E. (1946.) The treatment of caecal coccidiosis with sulphapyrazine.—*Poult. Sci.* 25. 390-391. 2367

I. While caecal coccidiosis in poultry is successfully treated by the addition of 0.1% sodium sulphapyrazine or 0.2% sulphamethazine to the drinking water, a warning is given that treatment should not be continued for more than seven days. When treatment extends over more than seven days, symptoms of vitamin deficiency may occur, presumably as a result of sterilization of the gut.

When chicks are treated with sulphamethazine for a period of two or more weeks the blood-clotting time is lengthened and multiple petechial haemorrhages have been seen in a few cases where dosing has been continued over a prolonged period.

Testicular enlargement, as a result of hyperplasia of the seminiferous tubules, and precocious development of the comb and wattles have been observed as a result of dosing with sulphapyrimidines, particularly sulphamethazine.

II. It is now reported that sulphapyrazine, given as a 0.1% solution in the drinking water, is even more effective than sulphamethazine in controlling caecal coccidiosis and is free from the danger associated with sulphamethazine. More detailed information is promised in a further article.—M. C.

HORTON SMITH, C., & BOYLAND, E. (1946.) Sulphonamides in the treatment of caecal coccidiosis of chickens.—*Brit. J. Pharm. Chem.* 1, 135-152. 2368

This is an intensive study of the treatment, with various sulphonamides, of caecal coccidiosis in chickens caused by the protozoon *Eimeria tenella*. Solutions of 0.2% sodium sulphamezathine [sulphamethazine] or 0.1% sodium sulphapyrazine were given instead of drinking water and excellent therapeutic effects were obtained. Solutions of 0.2% sodium sulphamerazine and 0.1% sodium sulphadiazine had some therapeutic effect, but sulphathiazole and sulphapyridine were ineffective in preventing symptoms of the disease in infected birds. It was found that chickens which recovered from an infection of caecal coccidiosis after treatment with sodium sulphamethazine and sodium sulphapyrazine, were immune to subsequent infection with *E. tenella* within the duration of time tested.

The most satisfactory therapeutic results were obtained when the drug concentrations in the blood were of the order of 5-10 mg. per 100 ml.

The therapeutic effect of sulphamethazine or sulphapyrazine in the chick is neutralized by *p*-aminobenzoic acid, 10 molecules of the drug being neutralized by one molecule of *p*-aminobenzoic acid. The action of the drug in the animal is dependent apparently on the use of *p*-aminobenzoic acid by the coccidia.

—E. M. J.

MOREHOUSE, N. F., & MAYFIELD, O. J. (1946.) The effect of some aryl arsonic acids on experimental coccidiosis infection in chickens.—*J. Parasit.* 32, 20-24. 2369

Two aryl arsonic acids, 4-hydroxy-phenylarsonic acid and 3-nitro-4-hydroxyphenylarsonic acid and their sodium salts, have given better results than any arsenicals previously tested against avian coccidiosis. Administered as preventives in the drinking water, they reduced haemorrhage and mortality resulting from *Eimeria tenella* infections. Birds surviving after consequence of treatment with 3-nitro-4-hydroxyphenylarsonic acid developed a considerable immunity towards subsequent infections with *E. tenella*; 4-hydroxyphenylarsonic acid had some effect against *E. acervulina*, but non-toxic doses were ineffective.—C. HORTON SMITH.

MOTT, L. O., STEIN, C. D., & HEISHMAN, J. O. (1946.) Penicillin treatment of acute equine infectious anaemia.—*Vet. Med.* 41, 131-136. 2370

A horse infected with a virulent strain of the virus of infectious anaemia had the clinical symptoms of acute swamp fever with raised temperature and decrease in red cell volume. Treatment with 6,000,000 units of penicillin given intramuscularly over 40 hours was started 43 days after infection. The treatment had no effect and the horse died on the 58th day.—E. BOYLAND.

I. SCHOOF, G. (1944.) Bekämpfungsversuche der

Geflügelpest mit Spirocid-Natrium und Impfung. [Control of fowl plague with spirocid sodium and inoculation.]—*Dtsch. tierärztl. Wschr. / Tierärztl. Rdsch.* 52/50, 81-82. 2371

II. SCHOOF, G., & OHM, H. (1944.) Bekämpfungsversuche der Geflügelpest mit Spirocid-Natrium unter praktischen Verhältnissen. [Experimental control of fowl plague with spirocid sodium under practical conditions.]—*Ibid.* 249. 2372

I. The therapeutic and prophylactic effect of daily doses of 0.125 g. and 0.25 g. of spirocid sodium was tried against fowl plague, using a small number of fowls. There was no evidence of any therapeutic action and very little evidence of any prophylactic effect as two treated fowls that did not contract the disease were later proved to be insusceptible to artificial infection. A few fowls vaccinated with TRAUB's vaccine were also exposed to infection and survived, but the dose given is not mentioned.

II. Following the use of spirocid sodium against fowl plague under experimental conditions the drug was tried in the field. Sixty-two fowls on clean premises were given 0.125 g. *per os* daily for four days on two occasions. During or soon after treatment, 58 fowls died of fowl plague. 192 fowls on diseased premises were given five daily doses of 0.25 g.; 130 died of fowl plague. The authors do not consider that the drug will prove of value in the control of fowl plague.

—W. M. HENDERSON.

*ROSSNER, E. (1944.) Sulfa for parrot pneumonia.—*All-Pets Mag.* 16, No. 7, 14-15. [Abst. in *Biol. Abstr.* Sect. F. 19, No. 5, 30, copied *verbatim*.] 2373

A 6-month-old parrot received in a shipment developed nostril discharge, lack of appetite, and difficult breathing. After ten days with various treatments and tonics it was about to die. Then about one grain of sulphathiazole was fed every 3 hours. Recovery was nearly complete in 2 days.

RAUCOURT, M. (1945.) Découverte récente d'un nouvel insecticide l'hexachlorocyclohexane. [Recent discovery of a new insecticide, hexachlorobenzene.]—*Nature, Paris*, No. 3093, pp. 235-236. [Abst. in *Rev. appl. Ent.* Ser. B. 33, 176-177, copied *verbatim*.] 2374

The author describes the physical and chemical properties of benzene hexachloride (hexachlorocyclohexane), the insecticidal properties of which were first observed in France in 1941, when samples of a mixture of the four known isomers, prepared by a new commercial method, proved to be very toxic to clothes moths. It is practically non-toxic to man and appears to act as a stomach poison, a contact poison and a fumigant against insects. Tests carried out in 1942-45 showed that it was of value against a number of insects attacking agricultural crops; that its vapour killed house-flies [*Musca domestica*, L.]; and that a 3 per cent. dust was highly effective against insects attacking man, such as fleas and lice [*Pediculus humanus*, L.].

MÜLHENS, K. (1944.) Über bisher nicht bekannte insektizide Eigenschaften der Baumwollsmilch (*Euphorbia dendroides* L.). [Insecticidal value of *Euphorbia dendroides*.]—*Dtsch. tropenmed. Z.* 48, 79-84. 2375

E. dendroides, a species of spurge growing in limestone areas in Crete, was found to be poisonous to fish: drops of the sap also killed ants. Aqueous extracts of the leaves, stem and roots were all found to be insecticidal to bugs, house flies, *Phlebotomus* and mosquitoes, the leaves appearing to have the greatest toxic content. Cold water extracts decomposed rapidly, but when

extraction was carried out at 55°C. decomposition was delayed for eight days. The addition of soap to the extracts increased their value. Finely powdered leaves insufflated into a flask containing flies also killed the insects. Alcohol and acetone extracts were actively insecticidal and it is suggested that a valuable insecticidal preparation might be manufactured from this plant by industrial methods of extraction.—U. F. RICHARDSON.

WHITLOCK, J. H. (1946). Ten per cent cunic for controlling gastrointestinal helminthiasis in sheep.—*Cornell Vet.* 36, 47-50. 2376

28 farm flocks consisting of 4-445 animals were treated 1-3 times with 10% "cunic" [copper sulphate, nicotine sulphate mixture] at the rate of 1 ml. per 10 lb. body weight. In some cases the solution was administered as a divided dose, 2-3 ml. being given to stimulate closure of the oesophageal groove followed 10 sec. later by the rest of the dose. Some flocks had been previously treated with phenothiazine or tetrachlorethylene, the first dose of the "cunic" mixture being given one month after such treatment. 3,690 treatments with 10% "cunic" mixture were given and in only one case was any untoward result observed, a lamb being narcotized for 5 min. Full details of egg counts are not given but they showed that in flocks previously treated with phenothiazine or tetrachlorethylene the "cunic" treatment controlled parasitism. One outbreak of trichostrongylosis in lambs receiving the "cunic" mixture only was not checked, and some cases of haemonchosis were seen in another flock. Control of *Moniezia* appeared to be poor.—T. E. GIBSON.

SHAW, J. N. (1944). Hexachloroethane treatment of liver fluke in Oregon cattle.—*Tech. Bull. Ore. agric. Exp. Sta.* No. 7, pp. 11. 2377

This bulletin records the treatment of two steers with hexachloroethane against *Fasciola* infestation, each being given 10 g. per 100 lb. body weight. One steer continued to pass *Fasciola* eggs and at P.M. examination five months later was found to be carrying flukes in the liver. The other treated steer harboured no flukes at P.M. examination five months after treatment, but *Fasciola* eggs were present in the gall bladder; two out of three faecal examinations after treatment were negative for fluke eggs.

Further trials using larger numbers of animals would be necessary for the final assessment of the value of hexachloroethane as an anthelmintic for *Fasciola hepatica*.—T. E. GIBSON.

FLATLA, J. L. (1944). Phenothiazin (Aftiazin, Fentiazin) som ormeniddel til hest. [Phenothiazine as an anthelmintic for horses (and other animals).]—*Norsk VetTidsskr.* 56, 313-328. [English and German summaries.] 2378

During experiments in controlling strongylosis in young horses by 30 g. doses of phenothiazine, 100 of the animals showed typical symptoms of poisoning. A thin, young, worm-infested horse from another stable was affected in the same way after receiving a similar dose. The effect on the strongyles was very satisfactory, the number of eggs per gramme of faeces being reduced from about 2,500 to nil in the course of 5-6 days.

In further experiments smaller doses were tested, 10-20 g. with a maximum of 25 g. for fully grown horses and 10 g. for foals and young horses. The dose was also adapted to the condition and presumed tolerance of the horse. The results were excellent; almost without exception the faeces were free from strongyle eggs in about one week after the treatment. The course of treatment with phenothiazine should not be repeated until at least two months have elapsed.

In sheep, phenothiazine appears to be effective

against *Ostertagia*, *Haemonchus*, *Bunostomum* and *Chabertia*, but has no effect at all on *Trichuris*, *Strongyloides*, *Moniezia* and liver flukes. The dose is relatively much larger than for horses, 0.5-1.0 g. per kg. body weight being given in gelatin capsules or in water by stomach tube, or in the form of tablets. In calves and young cattle it has proved effective against the same parasites as in sheep. The dose varies from 30 to 50 g. In pigs it was found to be particularly effective against *Oesophagostomum*, but also against ascarids. For animals of live weight between 10 and 90 kg. the dose varies from 5 to 30 g. In poultry, the drug, given in small gelatin capsules, or in water by means of a syringe, or in the feed, is reported to be effective against *Heterakis* and *Capillaria*. The dose mentioned is 0.05-0.5 g. per animal, although some investigators consider that 0.5-1.0 g. per kg. body weight is more suitable. It is now being tested on geese against *Amidostomum anseris*, the dose used being 0.5 g. per kg. body weight. The drug is ineffective against coccidiosis in rabbits. It is reported to be effective in disinfection of the urinary ducts and against *Enterobius vermicularis* infestation in man.—R. PETER JONES.

ROSENBERGER, G. (1944). Phenothiazin gegen die Magenwurm invasion der Schafe. [Phenothiazine against stomach worms in sheep.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50, 229-231. 2379

After preliminary tests, first on one sheep and then on five, in which phenothiazine was given with good effect at the rate of 1 g. per kg. body weight, an experiment was carried out on 198 sheep, the same dosage rate being employed. The drug was given in watery suspension by stomach tube. Clinical improvement was observed in even the most severely affected cases in 56 animals (38 lambs and 18 ewes) in which faecal examinations were carried out, a 96-100% decrease in the number of worm eggs present was noted 14 days after treatment. No toxic symptoms were noted in any of the sheep treated.

As a result of this trial, which confirms the findings of previous authors, it is suggested that phenothiazine should be used in the treatment of haemonchosis in practice in Germany and suggests that capsules or tablets should be prepared suitable for use in the field.

—T. E. GIBSON.

REINHARD, E. H., MOORE, C. V., BIERBAUM, O. S., MOORE, S., & KAMEN, M. D. (1946.) Radioactive phosphorus as a therapeutic agent. A review of the literature and analysis of the results of treatment of 155 patients with various blood dyscrasias, lymphomas, and other malignant neoplastic diseases.—*J. Lab. clin. Med.* 31, 107-218. 2380

Radioactive phosphorus has been used since 1936 for the treatment of various diseases, mainly leucemia and malignant disease. This paper reviews the published work, discusses the experimental evidence which supports the use of radioactive P, describes a series of 155 cases treated by the authors during the past four years, and evaluates the effectiveness of the method in comparison with other forms of treatment. There are many tables giving details of case histories and also a short appendix dealing with the assay of radioactive P.

In general it can be stated that radioactive P acts by emitting beta-rays, which exert a selective effect because of the concentration of the phosphorus in organs of a high P content, such as bone and tissues, the cells of which are multiplying rapidly. It is easy to administer and does not cause radiation sickness. The half-life of P^{32} (14.3 days) allows steady radiation for several weeks. Radioactive P is probably the best form of therapy in polycythaemia vera and is at least as useful

as X-rays in chronic myelogenous and lymphatic leucaemia. It is of little value in acute or subacute leucaemia (myelogenous or lymphatic), monocytic leucaemia, Hodgkin's disease, lymphosarcoma, reticulum cell sarcoma or multiple myeloma. The action of radioactive P on the bone marrow may result in leucopenia, thrombocytopenia and anaemia, usually in that order. In chronic leucaemia, X-rays are often more effective than radioactive P in reducing the size of the spleen and lymph nodes and the use of the two agents may be combined. Careful control of the use of radioactive P is necessary, using repeated blood and bone marrow studies as a guide. The assay of the agent is difficult and requires to be standardized in the various laboratories.—E. G. WHITE.

PLATT, W. R., BLUESTEIN, S. G., & SISSON, R. G. (1946.) The effect of liver extract and methyl acetamide with para-chloro-xenol on artificially induced leukopenia in rats.—*Yale J. Biol. Med.* 18. 275-279. [Authors' conclusions copied verbatim.] 2381

1. Oral administration of a liver extract preparation containing "folic acid" reverses the neutropenia and leukopenia produced by a purified diet containing an insoluble sulfonamide. This same extract does not correct a similar hematopoietic state produced by the injection of benzol.

2. The liver extract preparation containing "folic acid" apparently acts indirectly on the bone marrow by supplying this deficiency factor depleted by the activity of an insoluble sulfonamide by the reduction of the number of its synthesizers, the coliform bacteria.

3. Methyl acetamide with para-chloro-xenol reverses the agranulocytosis and leukopenia induced by benzol, but fails to correct the neutropenia produced by a purified diet containing succinylsulfathiazole.

4. Methyl acetamide with para-chloro-xenol apparently acts directly on the bone marrow by virtue of its peripheral leukotactic effect.

DRIEUX, H. (1946.) Thérapeutique biologique des cancers animaux. [Treatment of cancer in animals with tissue extracts.]—*Rev. Path. comp.* 46. 11-13. 2382

Malignant growths in horses, cows, dogs and men have been treated by different authors by the subcutaneous, intravenous or intradermal injection of 1-10 ml. of extracts of different tumour tissues. Encouraging results have been obtained particularly in the treatment of benign tumours and growths of the skin. In many cases the method of producing the extract used has not been published. No explanations are available for the results which have been obtained.—E. BOYLAND.

HADDOW, A., & SEXTON, W. A. (1946.) Influence of carbamic esters (urethanes) on experimental animal tumours.—*Nature, Lond.* 157. 500-503. 2383

Continued daily injections of 0.5 mg. per kg. of ethyl carbamate (urethane) to rats and mice inhibited the growth of established tumours. In the case of the Walker rat carcinoma, the treatment caused a histological change to a more fibrous type of growth. Ethyl carbamate was tried in some human cases of cancer without success, but PATERSON *et al.* [see V.B. 16. 376] observed that it produced a fall in the white cell count and obtained promising results in the treatment of myeloid leucaemia. The possible modes of action of urethane on inhibited cells are discussed. The effect appears to be independent of the narcotic action of the drug.—E. BOYLAND.

CECIL, R. L. (1945.) Chemotherapy in acute upper respiratory infections.—*Bull. N.Y. Acad. Med.* 21. 263-277. 2384

In this lecture, incorporating discussions by a number of clinicians, C. concludes that there is no point in taking sulphonamides or penicillin in the case of the common cold, unless it is liable to be followed by complications in the sinuses, trachea or middle ear. Both the sulphonamides and penicillin are of value in treatment of acute pharyngitis, tonsillitis, sinusitis, otitis media, mastoiditis and bronchitis.—E. BOYLAND.

COBURN, A. F. (1945.) Mass sulfadiazine prophylaxis of respiratory diseases in the U.S. navy.—*Bull. N.Y. Acad. Med.* 21. 281-301. 2385

Sulphadiazine was administered to 100,000 Naval personnel, 300,000 personnel being observed as controls. The most effective dosage was 1 g. per day which reduced the incidence of respiratory disease from 8-18 per 1,000 per month, to less than one per 1,000. Severe reactions occurred in 0.01% of men taking 1.0 g. sulphadiazine daily, but there were no cases of sensitization or of development of sulphadiazine-fast organisms.—E. BOYLAND.

LITTER, M. (1944.) Acción farmacológica del ácido nicotínico y su amida. [Pharmacological effect of nicotinic acid and nicotinamide in various animals.]—*Rev. Inst. bact., B. Aires.* 12. 149-178. 2386

The sodium salt of nicotinic acid and nicotinamide increase the amplitude of the contractions of isolated frog heart, in both small and large doses, but they have a variable action on the heart "in situ". In the dog, large doses of sodium nicotinate cause an increase in the amplitude of auricular and ventricular contractions.

Sodium nicotinate has an inconstant hypertensive action in the dog, whilst the amide has a constant hypotensive action. In the dog, neither drug has any apparent action on the peripheral circulation and it must be assumed that the peripheral vasodilator effect of nicotinic acid in man is species-specific. Sodium nicotinate stimulates the movement of isolated rabbit intestine, while nicotinamide is inhibitory. Large doses of the drugs cause similar actions in the canine intestine "in situ", especially in the small intestine. On the isolated uterine muscle of the virgin g. pig, the two drugs have no action, but in medium doses they have an inhibitory action on the tone of the uterine muscle of the virgin rabbit. Both drugs have a diuretic effect on the rat. The sodium salt causes diuresis in the dog, the amide inhibits it. It seems that these actions are secondary to general and local vascular phenomena. The toxicity of the two salts is very low.

Most of the actions described are rather variable, but the most clear-cut and constant reactions are the hypotensive effect of the nicotinamide, its inhibitory effect on the intestine, the stimulant effect of the sodium salt on the intestine and the diuretic action of both drugs.—I. W. JENNINGS.

ALEXANDER, F. (1945.) Pharmacological studies on the uterus.—*J. comp. Path.* 55. 140-145. 2387

The action of ecbolics on isolated strips of the uterus of the sheep, cow and mare was studied. Standard quantities of adrenalin, acetylcholine, ergotoxine, posterior pituitary extract and ergometrine were added to a bath in which the strips were suspended and the effects were recorded on a smoked drum. Adrenalin 1:1,000,000 contracted the uteri of virgin sheep and non-pregnant mares but inhibited the contractors in pregnant and non-pregnant sheep and also in pregnant and non-pregnant cows. Acetylcholine and ergotoxine contracted all uteri. Ergometrine 1:100,000 contracted the uterus of the pregnant ewe. All uteri were contracted by posterior pituitary extract at a concentration of 0.001 unit per ml. It is suggested that for practical

use, ergotoxine and posterior pituitary extract are effective echolics for sheep, cows and mares.—D. D. O.

GARDNER, A. D., & SEDDON, H. J. (1946.) Rapid chemical disinfection of clean unwashed skin.—*Lancet*. 250. 683-686. 2388

The skin-disinfecting power of a number of chemical agents was studied by swabbing the agent over circular areas of the skin of the human forearm which had previously been moistened with a suspension of a normal skin commensal (*Staphylococcus albus* isolated from the human skin). When the treated area had dried a sterile wet swab was applied and then plated on nutrient agar. Sterile distilled water was used on control areas of skin. The only agent which gave virtual disinfection with great regularity in 15-20 sec. was 2% iodine in 70% alcohol and this agent seems thus to be the ideal one for needle puncture and for surgical incisions. Ethyl alcohol alone required a longer time than 15 sec. for complete disinfection: the addition of 1:1,000 acriflavine to the alcohol gave no improvement and there was some suggestion that it even impeded the action of the alcohol. "Chlorox" (NaOCl, equivalent to 10-12% of available chlorine) was unsatisfactory after 1½ min., the time taken for it to dry on the skin. "Dettol" required 5 min. to dry and was a poor disinfectant undiluted and even worse when diluted. "Zephiran" [a quaternary ammonium salt] was more effective against *Pseudomonas pyocyaneus* than "CTAB" (cetavlon), disinfection being complete in 1½ mins.; iodine in alcohol was effective against this organism in 15-20 sec. Potassium permanganate (1:20) was usually ineffective after 1 min.

Some experiments were also performed with strips of skin excised before and after surgical operations. Preoperative skin treatment with 2% aqueous iodine gave results superior to 5% CTAB and much better than 1% CTAB. Disinfection with iodine was still effective up to two hours after the operation and its action was thus more persistent than is often supposed. Treatment of the operation sites consisted in each case of applying iodine on the day preceding the operation, covering with sterile dressings, and giving a second application just before operating. The excised skin strips were incubated in heart-extract peptone broth for 24 hours at 27°C. and for a further 2-3 days if no growth occurred.

The value of alcoholic iodine as a rapidly acting disinfectant was thus confirmed.—E. G. WHITE.

JORDAN, R. C., & JACOBS, S. E. (1945.) Studies in the dynamics of disinfection. III. The reaction between phenol and *Bact. coli*: the effect of temperature and concentration: with a detailed analysis of the reaction velocity.—*J. Hyg., Camb.* 44. 210-220. [For previous parts, see *V. B.* 15. 128 & 168.] 2389

The influence of temperature and phenol concentration on the death rates of *Bacterium coli* cultures was investigated, using the special apparatus and standardized technique described in previous papers. Five different phenol concentrations varying between 4.26 g. and 7.95 g. per litre were employed and at each concentration observations on the bacterial death rate were made at several different temperatures varying from 20° to 42°C. the majority being below 35°C. The experimental data and the results of statistical analyses are presented in tables and graphs.

The results revealed the true shape of the logarithm of the survivors—time curve, the distribution of resistance among the cells of the bacterial population and the effects of both temperature and phenol concentration on the time taken to produce various degrees of mortality. Discussion is restricted, however, to the logarithm of the

survivors' time curve. The death rate varied considerably during the course of each experiment, rising slowly at first, then sharply to a peak value and, thereafter, declining, sharply at first and then more slowly. The general course of the death rate was the same in all experiments, but increase of temperature and phenol concentration raised the maximum death rate.

The authors again recorded an excess of high values of χ^2 , the index of dispersion derived from the numbers of colonies on replicate plates. The factors responsible for this phenomenon were probably to be found in the sampling technique and in an altered and variable ability of bacterial cells to form colonies on plating out after considerable exposure to phenol.

In previous papers, straight lines were fitted to the experimental data after the maximum death rate had been reached on the assumption that this rate remained constant; since the standard error of the slopes of these lines were found to be small, this method of treatment was considered to give a good approximation to the course of the disinfection process. The same method of treatment was applied to the results now reported, apparently with equally satisfactory results, the S.E. of the slopes of the regression lines again being small. However, estimates of virtual sterilization times [v.s.t.] thus obtained were almost uniformly low and the above method is now considered to yield only fairly approximate estimates of the mortality times. The discovery of the true shape of the logarithm time curve has enabled more accurate estimates of the v.s.t. to be made by treating the last phase of slow decline as one of constant death rate. The v.s.t. calculated by the new method did not significantly alter the value previously obtained for the concentration exponent for phenol at 35°C.—W. R. MUIR.

JORDAN, R. C., & JACOBS, S. E. (1946.) Studies in the dynamics of disinfection. V. The temperature co-efficient of the reaction between phenol and *Bact. coli*, derived from data obtained by an improved technique. VI. Calculation of a new and constant temperature coefficient for the reaction between phenol and *Bact. coli*.—*J. Hyg., Camb.* 44. 243-248 & 249-255. [Authors' summaries copied *verbatim*.] [For part III, see preceding abstr. Part IV not traced.] 2390

V. The virtual sterilization time (v.s.t.) has been used as a measure of the rate of disinfection of *Bact. coli* cultures by phenol under carefully standardized conditions, and the relationship between this rate and temperature at five phenol concentrations has been examined.

The graphs of $\log(v.s.t.)$ against temperature reveal that the formula $t \times \theta^T = A$, as usually employed for the calculation of the temperature coefficient of the rate of disinfection, has only a limited applicability for these data. θ and Q_{10} increased with temperature especially at high concentrations, and at the lowest concentration there was a tendency for them to increase again as the temperature was reduced below a certain point. The other general type of formula, $t(T-a)^b = a$, used for the calculation of biological temperature coefficients, is also of very limited value when applied to these data since b increases with temperature at all concentrations.

The magnitude of these temperature coefficients and their manner of variation are considered in relation to previously published data by other authors and the way in which θ should theoretically vary with temperature is discussed.

VI. The virtual sterilization time (v.s.t.) has been used as a measure of the rate of disinfection of *Bact. coli* cultures by phenol under carefully standardized conditions. The relationship of this time to temperature

at each of five phenol concentrations has been examined from a fresh point of view, since it has previously been shown [see part V, above] that none of the commonly accepted temperature coefficients was satisfactorily constant. The relationship is such that a minimum or threshold temperature exists for each concentration. A corresponding "maximum" temperature has been fixed, defined as the temperature at which the *v.s.t.* is 10 min. The value of (*v.s.t.*—10) thus varies from infinity to zero between these temperature limits. Sigmoid curves are obtained when log (*v.s.t.*—10) is plotted against temperature for given phenol concentrations. These may be regarded as asymptotic to ordinates at the minimum and maximum

See also absts. 2409 (sulphadiazine resistance), 2403 (penicillin administration), 2291 (tumour treatment), 2275, 2279, 2281 (insecticides), 2402 (air sterilization).

HYGIENE, PUBLIC HEALTH AND VETERINARY SERVICES

CHRISTIANSEN, M. J. (1945.) Returnaelsk som Smitte-kilde. Erfaringer fra den praktiske Bekæmpelse af Husdyrtuberkulosen. 2. Meddelelse. [Returned milk as source of infection. Experiences in the control of TB. in domestic animals. II.]—*Maanedsskr. Dyrslaeger*. 57, 113–123. [For part I, see *V. B.* 13. 3.] 2391

TB. spread to seven dairy farms when calves and pigs were fed with mixed returned milk, supposed to be pasteurized. Infection was traced to a defect in the pasteurization plant.—M. EKENBERG.

GREAT BRITAIN. (1944.) Emergency Powers (Defence). Milk and Dairies, Scotland. The Heat Treatment of Milk (Prescribed Tests) Order (Scotland), 1944, dated November 4, 1944, made by the Secretary of State under regulation 55G of the Defence (General) Regulations, 1939.—*Statutory Rules and Orders 1944*. No. 1259/S. 60. pp. 4. London: H.M. Stat. Off. 8vo. 1d. 2392

This order imposes restrictions on the use of such descriptions as "heat-treated milk", "pasteurized milk" and "sterilized milk" which tend to deceive the public.

The phosphatase test and the methylene-blue test are officially prescribed and the manner in which such tests shall be carried out is detailed. No milk may be sold under any of the above designations unless it satisfies these prescribed tests.—D. S. RABAGLIATI.

ANON. (1945.) Milk still unsafe.—*Brit. med. J.* August 4th. 160–161. 2393

This is a plea for the execution of powers already obtained by the British Government to enforce pasteurization. The Government is severely criticized for not implementing the promises outlined in the White Paper "Measures to improve the quality of the nation's milk supply" [see *V. B.* 14. 141], which was followed by a Defence Regulation giving the Ministry power to specify in which areas such milk might be sold: it is pointed out that more than two years later no areas had been scheduled for compulsory pasteurization despite the fact that no less an authority than PROF. H. D. KAY, director of the National Institute for Research in Dairying, had declared that the pasteurization bogey was satisfactorily laid. The figure of 2,000 deaths a year from TB. of bovine origin among children under five years of age in the United Kingdom is again cited and it is noted the American troops in Great Britain were not allowed to drink milk unless it was both pasteurized and from tuberculin-tested herds.

—D. S. RABAGLIATI.

— (1945.) Discussion on the veterinary and medical

temperatures. The Pearl-Verhulst logistic equation gives a curve of the required sigmoid type, and this formula has been shown to fit the curves of log (*v.s.t.*—10) against temperature very satisfactory over the range of concentrations studied.

One of the constants of this formula partakes of the nature of a temperature coefficient, and it has, therefore, been possible to derive a truly constant temperature coefficient for each phenol concentration. The values of this new temperature coefficient do not vary greatly with phenol concentration within the range studied, but it is not yet possible to establish whether it is essentially constant for all phenol concentrations with which it is possible to work.

control of the milk supply. [Speakers: MATTHEWS, H. T., LETHAM, W. A., HIGGS, C., BROCKINGTON, C. F., STEWARD, J. S., DAVIES, J. L., BRANSBY, E. R., STEELE-BODGER, H. W., WOOLDRIDGE, W. R., & EDWARDS, J. T.]—*Proc. R. Soc. Med.* 38. 253–260. 2394

Representatives of the medical and veterinary professions met farmers interested in milk production to discuss the question of "clean" and "safe" milk and to suggest some method of obtaining future legislation and improvement as envisaged by the Government's White Paper on milk policy [see *V. B.* 14. 141].

In opening the discussion MATTHEWS pointed out that in practice there was risk to human health from only two diseases of cattle, TB. and brucellosis, and from the occasional epidemics which arise from human agency.

It was generally agreed that in spite of the many difficulties pasteurization was necessary for bulked milk sold in large consuming areas.—D. S. RABAGLIATI.

— (1945.) National milk testing and advisory scheme. Steam sterilization on dairy farms.—Form No. B.588/TPB. pp. 10. London: Ministry of Agriculture & Fisheries. 2395

In connexion with the national milk testing and advisory scheme, the Ministry of Agriculture and Fisheries have published a leaflet describing in detail the reasons for and methods of sterilizing milking utensils and equipment. It is pointed out that even when milk is pasteurized, sterilization of equipment is still necessary owing to the presence of the thermophilic types of organism which resist pasteurizing temperatures and the thermophilic types, which not only survive, but thrive in heat and may gain access to milk from dirty utensils and multiply during pasteurization. Sterilization by boiling water, steam, dry heat and the use of detergents is described in considerable detail, along with the best methods of producing heat by coal fuel, gas, electricity, oil fuel and so on. The knowledge contained in these notes is essential to anyone using modern dairy equipment.—D. S. RABAGLIATI.

SMYTHE, V. R. (1945.) Studies on the effects of transport and storage on the bacteriological quality of raw milk. Part 1. The reduction of methylene blue by raw milk as influenced by time and temperature of storage.—*Qd J. agric. Sci.* 2. 128–131. 2396

95,000 raw milk samples from the Brisbane district were subjected to the methylene-blue reduction test and incubated for various periods of time, up to five hours, at temperatures ranging from 5°–35°C. All temperatures above 10°C. resulted in a marked fall in

the reduction time as the storage period increased. The rate of deterioration, with increased storage time and with increased storage temperature, was greater in good quality milks than in milks of inferior quality.

—N. WICKHAM.

COOPER, T. V. (1946.) Food poisoning.—*J. R. sanit. Inst.* 86. 101–106. 2397

Various forms of food poisoning are briefly discussed under the three main headings of chemical poisons, including Sb, Cd, As, Pb, Zn, NaF and methyl chloride, poisoning due to inherent properties of foods, such as "mushroom" poisoning, berry poisoning, etc., and poisoning due to specific bacteria; in this are included botulism, salmonella and staphylococcal food poisoning and poisoning due to parasitic infestation, e.g. with *Trichinella spiralis*. The source of contamination in infection and the general symptoms are briefly described in each case.—R. ALLCROFT.

See also absts. 2209 (mastitis and the common cold), 2210 (milk cooling), 2235, 2236 (undulant fever), 2410 (milk and meat inspection in Pruton, England).

TECHNIQUE AND APPARATUS

*KARDOS, G. (1940.) [Free and combined blood sugar content of domesticated mammals.]—*Inaug. Diss., Budapest*. [Abst. from abst. in *Berl. Münch. tierärztl. Wschr.* (Wien. tierärztl. Mschr. July 9th. 227 (1943).] 2399

Blood sugar was estimated by the Sanchez colorimetric and the Schaffer-Hartmann iodometric methods, the former procedure giving higher values. Combined blood sugar concentrations measured by the method of Lustig and Ernst exceeded the values reported by these authors.—E. F. MCCARTHY.

— (1945.) The sterilization, use and care of syringes.—*War Memo. med. Res. Coun. Lond.* No. 15. pp. 23. London: H.M. Stat. Off. 4d. [Abst. in *Brit. med. Bull.* 3. 200, copied *verbatim*.] 2400

As is emphasized in the introduction to this memorandum, any risk, however small, will produce accidents if it is repeated often enough. Faulty injection technique—especially serious when it occurs in the course of mass inoculations or in hospital practice—has been responsible not only for mild inflammations and infections, but sometimes also for such conditions as streptococcal cellulitis and lymphadenitis, staphylococcal and streptococcal abscesses, tuberculosis, meningitis due to contaminated lumbar puncture needles, anaerobic infections, such as tetanus and gas gangrene and systemic diseases like infective hepatitis and malaria. This small handbook has therefore been compiled from the experience of many workers and the results of extensive bacteriological tests, as a guide to methods which have been proved both safe and practicable for use in hospitals and for mass inoculations. It should be invaluable to those responsible for the instruction of medical students and nurses who must be made fully aware not only of the correct methods, but also of the risks which attend careless and imperfect technique.

The memorandum contains the obvious injunction that syringes used for the aspiration of septic material should never be used for an aseptic purpose, such as the injection of sterile medicaments. As there is no absolutely dependable method of sterilizing a syringe except autoclaving or heating in a dry oven at 160°C., one of these methods is recommended. Such a temperature would melt the cement at the glass-metal junction of the "Record" type of syringe, making the employment of such a syringe impossible. The memorandum

ANON. (1943.) The Madras Serum Institute.—*Indian Fmg.* 4. 458–460. 2398

This popular article describes the working of the Institute since its inception in 1932, before which all biological products were purchased from the Imperial Veterinary Research Institute, Mukteswar, at a cost of about Rs. 3½ lacs, and were stocked in cold storage. At first, only, rinderpest antiserum and virus were manufactured, but by 1937 vaccine against haemorrhage septicaemia was also being produced, with the necessary expansion in staff, equipment and buildings. By 1940, blackleg antiserum and vaccine, bovine lymphangitis vaccine, fowl cholera vaccine and antiserum and fowl pox vaccine had been included. Some neighbouring provinces and states now purchase these products from the Madras Serum Institute. Research on the improvement of sera and vaccines is also in progress.

During the war the Institute was moved to the Agricultural College Building at Coimbatore.—J. A. I.

does in fact strongly advocate the use of a two-piece all-glass syringe, and recommends that it should conform to the rigid specification laid down by the British Standards Institution for *All-glass hypodermic syringes*, No. B.S. 1263 (1945). This specification has been specially compiled for syringes to be used in accordance with the instructions set out in the memorandum.

The contents comprise: (i) introduction; (ii) the sources and avoidance of infection following injections; (iii) the choice of syringes and needles; (iv) instructions for sterilizing all-glass syringes; (v) disinfection of syringes by boiling, (vi) disinfection of syringes by means of alcohol and other chemical disinfectants; (vii) disinfection by the hot-oil method; (viii) mass inoculations; (ix) mass intravenous injections; (x) the care of needles; (xi) a syringe service for a hospital; (xii) the use of syringes for certain special purposes. Appendix A: Disinfection with alcohol. Appendix B: Methods of testing syringes for leakage. Appendix C: References.

ALLISON, V. D. (1945.) The sterilisation, use and care of syringes.—*Mon. Bull. Min. Hlth Emerg. publ. Hlth Lab. Serv.* 4. 196–198. 2401

A summary is given of the Medical Research Council's War Memorandum of the same title. [See preceding abst.]—D. D. OGILVIE.

BIGG, E., & JENNINGS, B. H. (1944.) The introduction of glycols for air sterilization by a new vaporization method.—*J. Indust. Hyg. Toxicol.* 26. 307–312. [Abst. in *Bull. Hyg., Lond.* 20. 156, slightly amended. Signed: T. BEDFORD.] 2402

If triethylene and propylene glycol vapours are to be used for the control of air-borne infection in occupied spaces some practical method of introducing measured quantities of glycol into the atmosphere is required. This paper describes an apparatus of simple construction and operation which can be used for that purpose.

Glycol vapour is effective at relative humidities of 25 to 80 per cent. but its greatest bactericidal activity is at relative humidities between 30 and 50 per cent. The device here described introduces water and glycol into the air simultaneously, thus eliminating the need for separate humidification arrangements. This is accomplished by boiling glycol-water solutions, for the proportions of glycol and water vaporized from such solutions depend upon their proportions in the solutions,

while the rate at which they are vaporized depends on the rate of boiling, i.e., on the heat input.

The glycol-water solution in a metal tank is heated electrically by immersion heaters, and a thermo-switch operates a valve which admits water to the tank. By this arrangement the required proportions of glycol and water in the solution are maintained. Safety devices are incorporated to guard against overheating and overflowing of the tank. The vaporizer is connected with the ventilation trunking so that the vapours are distributed by the ventilating air. The rate of vaporization obviously depends on the space to be treated, and on the rate of air change. A triethylene glycol concentration of 0.003 to 0.005 mg. per litre of air is suggested.

ECKMAN, M., RUMSEY, C. C., JR., BARACH, B., & BARACH, A. L. (1945.) A demand apparatus for automatic delivery of aerosols during inspiration.—*J. Lab. clin. Med.* 30. 608-610. 2403

The apparatus described was designed to conserve supplies of penicillin used for continuous admission by the respiratory route. When penicillin is nebulized, some of the drug is lost during expiration: by means of a suitable valve system, the aerosol is delivered only during the cycle of inspiration and the loss is reduced to a minimum.

The details should be studied in the original.

—R. E. GLOVER.

NORTHROP, M. A. (1945.) Surgical treatment of acoustic pathology.—*N. Amer. Vet.* 26. 480-483. 2404

An operation is described for the relief of chronic otitis externa. The aim is to enlarge the external auditory meatus and to eliminate protruding cartilaginous folds. After the usual preparatory technique an incision is made with scissors parallel to the longitudinal axis of the meatus along the ventro-lateral border of the auditory canal and overlying skin, resulting in incision through skin and cartilage. The incisions are prolonged carefully with a knife in order to avoid injury to the adjacent parotid gland and facial nerve. A section of the posterior border of the exposed canal and skin of the ear flap is then removed and all protruding cartilage trimmed off. The edges of the wound are approximated and the outer and inner skin incisions sutured together all round the V-shaped incision.

Healing by first intention is essential to the success of the operation. The sutures are removed under anaesthesia after nine days, at which time, rather than at the operation, it is suggested that the granulation tissue, which may have been the cause or result of the condition, should be removed.—C. W. OTTAWAY.

GANGULEE, H. C., & GANGULEE, P. C. (1944.) Some notes on the staining methods of corpora-negri in rabies.—*Indian vet. J.* 21. 69-76. 2405

See also abstr. 2423 (laboratory methods of the U.S. Army).

Twelve staining methods for Negri bodies are listed.—D. A. MUNRO.

AGYEN-FREMPONG, S. (1944.) Gold Coast. The manual of veterinary laboratory routine. pp. 35. Accra: Govt. Printing Dep. fcp. 3s. 2406

This booklet is designed for the use of English-speaking members of the African staff of the veterinary department of an African colonial territory and it is written by an African Veterinary Assistant of the Pong Tamale Veterinary Laboratory, Gold Coast. The booklet is divided into five main parts, as follows. Bacteriological methods (pp. 5-15); Infection, immunity and manufacture of laboratory products (pp. 16-23); Culture media and culturing (pp. 24-25); Tests (pp. 26-27), and an Appendix (pp. 27-35). There are also a very useful index and 16 illustrations.

The subjects covered concern the details of the laboratory and field work that would be dealt with by the staff concerned, including the preparation of certain routine culture media, section cutting, staining and the preparation of materials for inoculation into animals, certain routine laboratory tests and the separation of blood serum. There are useful practical notes concerning the important animal diseases of West Africa and tables with various details concerning thermometry, etc.

The booklet should be most useful. It is a noteworthy pioneering effort.

TROWBRIDGE, M., JR. (1946.) An in vitro method for determining the resistance of beta hemolytic streptococci to sulfadiazine.—*J. Lab. clin. Med.* 31. 248-252. [Author's summary copied verbatim.] 2407

A simple method of determining the sulfadiazine resistance of Group A beta hemolytic streptococci is described. The test is based on the observation of Kohn and Harris, that sulfonamide antagonists do not influence results greatly if an appropriate degree of growth inhibition is measured.

*PÖTSCHKE-SCHNEIDER, H. E. (1943.) Zur Frage, ob die Abtötung der Trichinen in gepökeltem oder gekochtem Fleisch mikroskopisch feststellbar ist. [Value of microscopic examination for testing whether trichinae in pickled or cooked meat are killed.]—*Inaug. Diss., Hanover*. [Abst. from abst. in *Z. Fleisch- u. Milchhyg.* 54. 48-49.] 2408

Microscopical examination of pickled or cooked meat can readily be used to determine whether trichinae have been killed. Dead trichinae show no movement on warming, remain coiled and show marked structural changes. The parasites are killed in pieces of meat 4-5 cm. thick immersed in boiling water for 1 hour; pieces 10 cm. thick require 2 hours. Pickling in 25% brine kills trichinae in pieces 10 cm. thick in 25 days; meat 4-5 cm. thick requires only 16 days' pickling.

—H. E. HARBOUR.

MISCELLANEOUS

MITSCHERLICH, E. (1944.) Weidehygiene in den ariden und semiariden Gebieten der warmen Länder. [Pasture hygiene in arid and semi-arid warm climates.]—*Dtsch. tropenmed. Z.* 48. 68-79. 2409

In many arid areas in the tropics, or semi-tropics, the nutritive value of pastures is so low that only small thrifty breeds of stock with relatively small productivity may be kept; pastures often fail to supply nutritional necessities and deficiency diseases result. Natural pasture consists of grasses, lower plants and the foliage of bushes and trees and its value is influenced by the climatic conditions, the mineral content of the soil,

the plant covering and the seasonal stage of its development, the vigour of the pasturage and the effect of grass burning.

Calcium deficiency has been recorded in S. Africa, Ceylon, Madagascar, Hawaii, the Philippines and the Falkland islands. Cobalt and iron deficiency occurs in Kenya and New Zealand, and a salt deficiency probably occurs in many areas. Phosphoric acid deficiency is widespread throughout Africa. It has been estimated that the phosphoric acid content of the soil should be at least 0.005-0.01% P_2O_5 . The nutritional value of pastures is greatest in the early rains, decreasing under

the influence of the scorching sun. The loss of digestible protein in sun scorched grass is particularly marked, but the sun has less effect on the foliage of shrubs and the pods of acacia which are readily eaten by stock contain 7-8% digestible protein. It is estimated that stock require 2.5% digestible protein, and 0.2-0.3% phosphoric acid, but the dry season content of pasture falls far below these figures, unless edible shrubs are available. The deficiencies lead to osteomalacia, *lamiekte* and Waihi disease (New Zealand). It is thought that a vitamin A deficiency may also occur in dry season pastures, accounting for the prevalence of skin diseases in calves.

It is claimed that controlled stocking improves grazing as seeds are trodden into the soil and old grass is removed, but with heavy grazing the nutritional value is decreased and contents are removed which are difficult to replace. Thus it has been estimated that 360,000 tons of phosphoric acid have been removed from the soil of Victoria, Australia, by the export of stock, and that 2,000,000 tons of superphosphate are required to restore its fertility. Overstocking tends to destroy the valuable plants which the animals eat and to favour the less valuable and poisonous species which may be eaten, particularly in the early rains, when they spring up before the valuable species. The destruction of the pasture covering exposes the soil to erosion by wind and rain and as rain tends to run off the naked soil rather than sink in, the level of the ground water sinks, thus reducing the suitability of the soil for plant growth. Grass burning removes a considerable quantity of organic matter from the soil and again exposes it to erosion. In spite of its value in the destruction of insects, worm larvae, etc., it is only to be recommended

when old grass must be destroyed; small patches should be burned at a time and when the soil is moist. M. emphasizes further that heavy stocking favours the transmission of infectious and parasitic diseases, and that the presence of game has also to be considered in this respect.

Measures recommended for the improvement of the nutritive value of pastures include the feeding of stock with phosphorus preparations or bone meal, and the dressing of land with superphosphates. To counteract vitamin deficiency the planting of spineless cactus is advised and for protein deficiency the feeding of maize and lucerne, the use of silos, and the planting of edible shrubs.

M. recommends that pasturage be fenced and farms divided into camps, and grazed rotationally in order to rest areas and to allow grasses to recover and the ground to clear itself of micro-organisms and worm larvae. Separate summer and winter camps are recommended, the summer camps being used in rotation, so that exhausted areas are grazed in the autumn, and seeds trodden in, and then rested in the following spring and summer to allow the new grasses to become established. The method of rotation is also designed to give areas periodic freedom of stock for long periods. The suggested rotation for a farm with three summer camps is given as follows.

YEAR	CAMP I	CAMP II	CAMP III
1	Autumn	Spring	Summer
2	Autumn	Summer	Spring
3	Summer	Summer	Spring
4	Spring	Autumn	Summer
5	Spring	Summer	Autumn
6	Summer	Spring	Autumn.

—U. F. RICHARDSON

REPORTS

GREAT BRITAIN. (1944.) County Borough of Preston. Report of the Medical Officer of Health on the health of the Borough for the year 1943. pp. 43. Items of veterinary interest pp. 27-29. Preston: R. Seed & Sons. 4to. 2410

The greater part of this report is concerned with matters which are not of veterinary interest. Quarterly inspections of cattle in the borough were carried out and a constant watch was kept on the quality of milk supplied to schools. 171 samples of milk were examined for physical contamination by dung or other dirt, for butterfat content and for keeping quality. 118 samples were clean, 34 fair, 16 contaminated and three seriously contaminated. Of 169 samples of ungraded raw milk, 60 had coliform bacilli present in 0.01 ml. and tubercle bacilli were present in seven. In two samples of pasteurized milk examined, no tubercle bacilli were present and coliform bacilli were absent in 0.01 ml. Visits of inspection were carried out at premises where meat and fish were sold or prepared. 11,180 bovines, one goat, 33,672 sheep and 1,138 pigs were slaughtered in the public abattoir during the year and 491,115½ lb. of meat were condemned (327,247 lb. of this by reason of TB.). The meat condemned included the carcasses of 1,067 bovines, 36 pigs and 110 sheep.—T. E. GIBSON.

I. GREAT BRITAIN. (1943.) Annual report by the Curator of the Laboratory, Royal College of Physicians of Edinburgh, for the year 1942. [HEWAT, A. F.] pp. 16. Edinburgh: University Press. 4to. 2411

II. GREAT BRITAIN. (1944.) Annual report by the Curator of the Laboratory, Royal College of Physicians of Edinburgh, for the year 1943. [HEWAT, A. F.] pp. 12. Edinburgh: University Press. 4to. 2412

III. GREAT BRITAIN. (1945.) Annual report by the

Curator of the Laboratory, Royal College of Physicians of Edinburgh, for the year 1944. [HEWAT, A. F.] pp. 12. Edinburgh: Royal College of Physicians. 2413

I, II & III. General accounts of the activities of the laboratory, details of the finances and statistics of the examinations performed in the routine section are given, together with brief summaries of the research. Certain projects have extended over the three years, viz, work on cancer and antimalarials, the production of a basic medium for the cultivation of bacteria and the typing of the pneumococci received in the routine department. Work was also carried out in 1943 on the use of oxalated blood for diagnosis and in 1944 on the air-dried blood film and on haemoglobin. Work on statistics is reported for 1943 and 1944.—T. E. GIBSON.

TRINIDAD AND TOBAGO. (1943.) Report of the Agricultural Policy Committee of Trinidad and Tobago (Part 1). pp. 142. Items of veterinary interest pp. 60-61. Trinidad & Tobago: Govt. Printer. 8vo. 50 c. Second printing. 2414

This report deals with agricultural development in Trinidad and Tobago, including a long term policy for agricultural development. The report as a whole is not of direct interest to the veterinarian. The practice of artificial insemination for stock breeding and the institution of artificial insemination centres under qualified management are advocated. The Government should at some future date set up a panel system of veterinary services but until this can be accomplished, stock inspectors, stockmen and agricultural instructors should be trained in livestock improvement work, so that they may act as a liaison between veterinary officers and stock-breeders.—T. E. GIBSON.

SWAZILAND. (1945.) Annual report of the Veterinary and Agricultural Department, for the year 1944. [FAULKNER, D. E.] pp. 26. fcp. Mimeographed. 2415

Part I of this report includes sections on colonial development and a general review covering controls, nutrition, animal health, animal industry and dairying, general administration, legislation and finance. Part II contains divisional reports on animal health and industry on agriculture and agricultural experimental stations and on dairying, water supplies and forestry. Tabular appendices give figures relating to staff, livestock industry, disease control and the dairy industry. The staff was strengthened by the addition of one V.O. during the year. Of the total estimated budget of £51,306 for the whole department, £26,867 was allocated to the veterinary division.

During the year some 18,000,000 cattle dippings, some 66,000 weekly hand-dressings and 56,090 inoculations were made against ANTHRAX, BLACKLEG, etc. An outbreak of FOOT AND MOUTH disease within ten miles of the Territory's northern border fortunately did not reach Swaziland. It is hoped that the control of disease, especially EAST COAST FEVER will be so effective that animal exports to the Union of South Africa will be unrestricted. Some progress was made in extension work but this was limited by the smallness of the staff of one agricultural officer, two assistant officers and 30 demonstrators. Prolonged drought was responsible for very low butter production and for the first time since the inception of the creamery, butter rationing had to be introduced for a short period; during that time no first-class butter was exported to the Union. Nevertheless, no butter was degraded, either at Johannesburg or Durban, the two main selling centres, and reports on the butter exported were excellent. The number of baconers marketed by the creamery was lower than usual as a result of shortage of butter milk and feeding stuffs. Farmers are being encouraged to take weaners from the creameries to use up their surplus separated milk.—D. S. RABAGLIATI.

GRENADA. (1943.) Report on the Agricultural Department for the Years 1941-1942. pp. 6. Items of veterinary interest p. 2. St. George's: Govt. Printer. fcp. 6d. 2416

During 1941, exports of goats, sheep and pigs totalled 7,723 and of poultry, 27,432. There was a prohibition on export in 1942. Slaughter of animals on the island was also controlled to avoid decimation of those existing.

In an epidemic of SWINE FEVER, 1,129 pigs were slaughtered. The livestock on the island is not sufficient to supply the manure required for crops.—J. A. G.

COLONY OF MAURITIUS. (1944.) Annual report of the Department of Agriculture, 1943. pp. 30. Port Louis: J. H. Bowkett, Govt. Printer. 90 cents. Items of veterinary interest p. 3 & 24. 2417

The general sanitary conditions of livestock were satisfactory. Of 819 cattle tested for TUBERCULOSIS approximately 24% were infected. Five cases of BOVINE CONTAGIOUS ABORTION were recorded at the Government Dairy. Only one case of TRYPANOSOMIASIS (*T. vivax*) was diagnosed in 7,834 blood smears examined. A few cases of PIROPLASMOSIS were diagnosed. Systematic treatment of HELMINTH INFESTATION in sheep is proving effective. Further importations of young bulls appear to be an urgent need. "Pure-bred pig breeding stock imported two years ago has increased the standard of crossbreds." Drought conditions were not favourable for livestock.—J. A. GRIFFITHS.

SIERRA LEONE. (1944.) Annual report of the Department of Agriculture for the year 1943. pp. 18.

Freetown: Govt. Printer. 1s. 6d. Items of veterinary interest p. 12. 2418

Pig-rearing was discontinued at Teko Stock Farm as a result of mortality from TRYPANOSOMIASIS. As the Veterinary Department had insufficient staff, the control of the Teko Stock Farm returned to the Agricultural Department.—J. A. GRIFFITHS.

ZANZIBAR PROTECTORATE. (1944.) Annual report of the Department of Agriculture for the year ended 31st December, 1944. pp. 8. Zanzibar: Govt. Printer. fcp. 75 cents. Items of veterinary interest pp. 7-8. 2419

ANTHRAX occurred among goats but the outbreak was checked by quarantine measures. Two outbreaks of RINDERPEST occurred simultaneously near Zanzibar Town and on Fumba Peninsula among native-owned cattle; 64 died and 45 were slaughtered. The control measures prevented spread of the disease. Kenya goat virus was used to immunize the 8,860 bovines in Zanzibar Island and the 20,800 in Pemba Island. A veterinary officer was loaned by the Tanganyika Government to deal with the outbreak.

TRYPANOSOMIASIS in cattle was treated chiefly with tartar emetic. Phenanthridinium is being used experimentally and relapse cases are said to be less frequent than when tartar emetic is used. Mass blood examinations of native-owned cattle are made in certain areas.

Other diseases reported were EAST COAST FEVER, HELMINTH INFESTATION and MANGE in goats, REDWATER in cattle, TICK FEVER in dogs, FOWL TYPHOID and NEWCASTLE DISEASE.

As a result of good weather, conditions were favourable for livestock. Cassava root was in good supply for the supplementary feeding of dairy cows. Slaughter stock imported from Tanganyika included 2,354 cattle, 11,180 goats and 765 sheep and from Somaliland, 180 cattle, 2,245 goats and 168 sheep.

The Stock Farm is under the supervision of the Assistant Veterinary Officer and is making good progress; there has been no recurrence of disease among the calves.—J. A. GRIFFITHS.

BASUTOLAND. (1945.) Annual report of the Department of Agriculture for the year ended 30th September 1944. pp. 16. Basero: Mazenod Institute. 8vo. Items of veterinary interest pp. 9-14. 2420

There was one outbreak of ANTHRAX, causing death to five cattle and one pig; 37,938 cattle were immunized.

12,581 cattle were immunized against BLACKLEG. ANAPLASMOSIS was controlled by the preventive inoculations of previous years. 1,997 animals were inoculated during 1943-44. In a severe outbreak of HORSE SICKNESS in the Butha Buthe area, 50 horses died in one valley. BLUE TONGUE was prevalent in certain areas. There was an increase in the number of outbreaks of EQUINE MANGE. 4,344,973 doses were administered to sheep and 2,097,966 to goats against HELMINTH INFESTATION. 16,884 sheep and goats, 2,087 cattle, 715 horses, 10 mules, 200 donkeys, 200 fowls, and 15 pigs were castrated.

The poultry improvement scheme was reported to be progressing favourably.

Generally speaking, the prices of wool mohair and other animal products were maintained at remunerative levels. Imports of breeding stock included six Brown Swiss, a South Devon, six Afrikanter-Sussex cross, 14 Sussex, a Jersey, and 296 Afrikanter cattle and two stallions. This brings the total of stallions and donkey jacks imported since 1936 to 67 and 43 respectively. Tamworth × Large Black pigs are favoured by African breeders. Sheep imports increased by 5,470. Cattle exports decreased by 8,264 and those of sheep by 2,086.

No general animal census was taken.—J. A. G.

NYASALAND PROTECTORATE. (1945.) Report of the Veterinary Department for the year 1944. [DE MEZA, J.] pp. 4. Zomba: Govt. Printer. fcp. 2421

The limited staff restricted the activities of the Department.

There was a slight increase in the numbers of livestock in some areas. Animal health was the worst for several years. A few cases of TUBERCULOSIS in poultry were diagnosed in the Central and Southern Provinces. An extensive outbreak of BLACKLEG involving 10,000 head of cattle caused anxiety in the Central Province, but was brought under control by the use of vaccine. Outbreaks of TRYPA NOSOMIASIS covered a larger area, including North Nyasa, Kasunga, Ncheu, Blantyre and Chikwawa districts. In Lilongwe and Dowa districts the position improved.

In field operations in the Southern Province all animals in a herd infected with TRYPA NOSOMIASIS were given injections of "stibophen". The effects of this preparation were not lasting, the blood remaining free from parasites for 2-3 weeks only. Later in the year phenanthridinium compound (897) was given in one injection and this was found effective in the majority of animals treated; the few animals relapsing responded to a second dose of this compound. Very few deaths occurred in these outbreaks. It is difficult to assess the value of phenanthridinium compound (897) as reinfection may take place owing to the presence of *Glossina brevipalpis*. Native-owned animals were treated by six intravenous injections of tartar emetic at five-day intervals. Control of tsetse fly by decontaminating vehicles and persons passing from infested zones proved beneficial as there was a reduction in the number of animals infected with the disease.

As the position in Tanganyika was satisfactory no inoculations of cattle against RINDERPEST were found necessary in North Nyasa. Guards to keep out game are still maintained. There was an increase in the

number of suspected cases of RABIES and in the number of specimens sent in for examination. While there was a decrease in the number of cases of EAST COAST FEVER recorded in the Central Province as a result of better supervision of dipping, in the Northern Province, where there was no supervision, losses from tick borne diseases rose. Field control improved. Early diagnosis made possible by the examination of smears sent in by the African staff allowed of a rapid change-over from seven to five day dipping. In 1943, of 7,601 smears 425 were positive, while in 1944, of 16,069 smears 342 were positive. A special study of the condition, including a careful tick survey, was made by S. G. WILSON, Veterinary Officer. A very large percentage of cattle slaughtered in the abattoirs had livers damaged by FLUKE INFESTATION.

Poultry in the Southern Province were remarkably free from disease; the poultry improvement unit at Lilongwe was maintained. Some progress was achieved in persuading cattle owners to build separate accommodation for their cattle and as a result, fewer animals were lost from fires in the dwelling huts in which they were formerly housed. The unit for demonstrating pack work and light ploughing by donkeys aroused little enthusiasm among the local inhabitants at Dedza.

The marketing of ghee has now been taken over from the Department by a commercial firm and prices are controlled. A considerable quantity of butter was made at the Native Authority Animal Husbandry Centres at Lilongwe and Dowa where there is a ready market among Europeans. A palatable cheese of good texture was produced experimentally under supervision of an officer of the Department.

There is a good local demand for slaughter animals, especially for markets supplying Africans. Military requirements have decreased but livestock they require are still purchased by officers of the Department.

—J. A. GRIFFITHS.

See also abstr. 2217 (Northern Ireland, summer mastitis, 1944-45), 2310 (Laboratory of Pathological Investigation, Bogota, 1943).

BOOK REVIEWS

BENBROOK, E. A. [V.M.D., Professor of Veterinary Pathology, Division of Veterinary Medicine, Iowa State College, Ames, Iowa]. (1945.) List of parasites of domesticated animals in North America. pp. 44. Minneapolis, Minn.: Burgess Publishing Co. 2422

This book comprises a list of the parasites of the domestic animals reported for North America north of Mexico, and is intended to supplement the lectures and laboratory work of a course in veterinary parasitology. The parasites are listed according to the system of the body in which they are found and each systematic list is arranged alphabetically. For each parasite the genus and species are given in accordance with the International Rules of Zoological Nomenclature; the common name is also given, and classification as protozoan, trematode, cestode, acanthocephalid, nematode, insect or arachnid is indicated. The location of the principal lesions produced by the parasite is recorded, and in some cases this includes organs through which the parasite may pass during some phase of its life-cycle. The maximum size of the parasite is given.

The list should help practitioners in other countries

as well as in America in the identification of parasites found in the organs of domestic animals at P.M. examination.—T. E. GIBSON.

— (1944.) Laboratory methods of the United States Army. [Edited by SIMMONS, J. S., & GENTZKOW, C. J.] pp. 823. 103 figs., 8 plates. Philadelphia: Lea & Febiger. 5th Edit. 8vo. \$7.40. 2423

This book is remarkable for its breadth and completeness. The techniques of clinical pathology, biochemistry, mycology, bacteriology, protozoology, helminthology, entomology, pathology and statistics are all covered in a book which is only about 1½ in. thick. The general emphasis is on medical laboratory methods but there is a short chapter of a dozen pages on special veterinary laboratory methods. Methods are dealt with in ample detail but reasons for processes are not discussed. A remarkable omission is the detection of poison gases, although general toxicology is dealt with in considerable detail. The different chapters have been written by 26 specialists, so that there is some variation in the treatment of different subjects; nevertheless, the standard remains uniformly high.—E. BOYLAND.

See also abstr. 2276 (insects and Arachnida injurious to health in the tropics), 2406 (manual of veterinary laboratory routine).

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11.	Some British books on agriculture, forestry and related sciences, 1939-45. July, 1946	3s. od.

TECHNICAL COMMUNICATIONS, ETC.

Imperial Bureau of Animal Health, Weybridge.	
Review Series No. 2. Modes of spread of <i>Streptococcus agalactiae</i> infection in dairy herds. A report on co-ordinated observations by the Agricultural Research Council of the United Kingdom. May, 1944	3s. od.
Imperial Bureau of Animal Nutrition, Aberdeen.	
15. Minerals in pasture. Deficiencies and excesses in relation to animal health. By F. C. Russell. May, 1944	5s. od.
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Imperial Bureau of Animal Breeding and Genetics, Edinburgh.	
The semen of animals and its use for artificial insemination. By James Anderson. Spring, 1945	7s. 6d.
Imperial Bureau of Pastures and Forage Crops, Aberystwyth.	
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